

SOUTHERN POWER AND INDUSTRY

MARCH, 1956

SPI's 52nd Year

**BULLETIN BOARD FOR
SOUTHERN INDUSTRY**

Products and engineering services of leading Southern and Southwestern manufacturers are highlighted in this issue.

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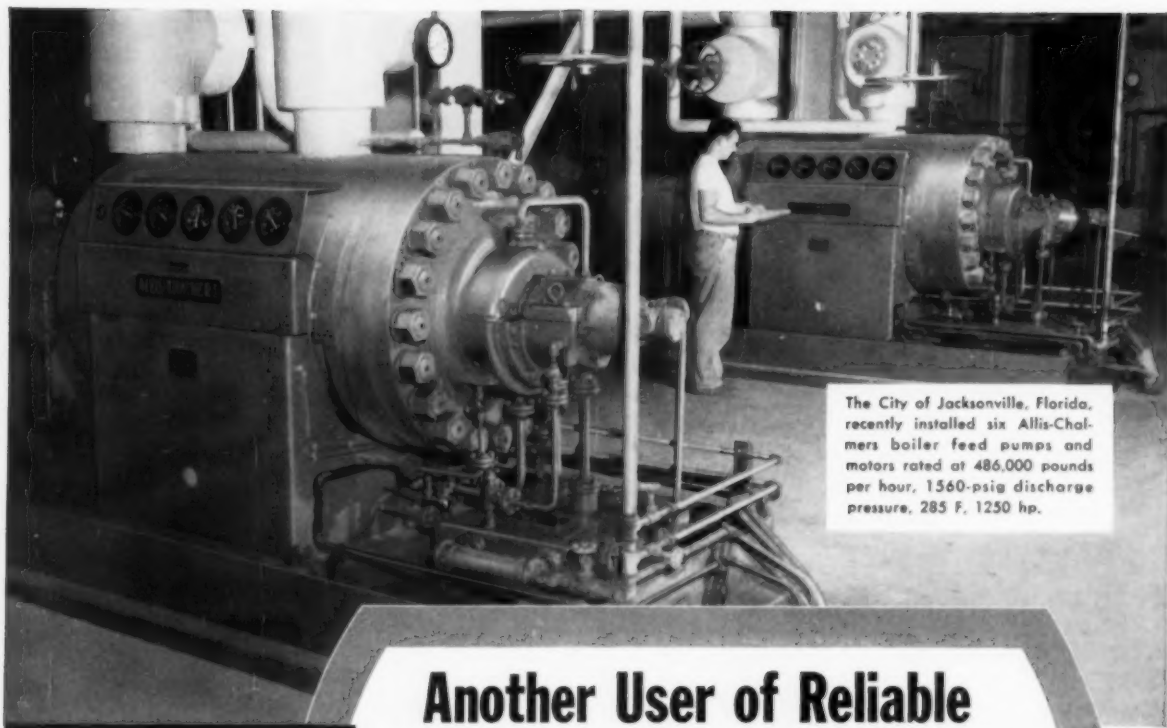
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The City of Jacksonville, Florida, recently installed six Allis-Chalmers boiler feed pumps and motors rated at 486,000 pounds per hour, 1560-psia discharge pressure, 285 F, 1250 hp.

**City of
Jacksonville**

Another User of Reliable **ALLIS-CHALMERS** barrel-type **PUMPS**

*Here are the reasons
for wide acceptance
of these pumps:*

- Outstanding performance — fully proved by service records.
- High efficiency and smooth operation under fluctuating loads — first stage has twin, single-suction impellers for low NPSH requirements.
- Simple maintenance—expansion joint and shaft seals are brought to outside of pump where they can be easily inspected.
- No balancing device needed—axial balance is maintained by back-to-back mounting of the impellers.

THERE are outstanding features like these throughout the Allis-Chalmers line. Whether you require boiler feed, condensate, circulating or other power plant pumps — it pays to standardize on Allis-Chalmers.

In addition, A-C can supply pumps, motors and control of coordinated design and manufacture. This means one responsibility — one guarantee of satisfaction.

Get complete information on barrel-type boiler feed pumps. Call your nearby A-C office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin for Bulletin 08B7899.

A-4854

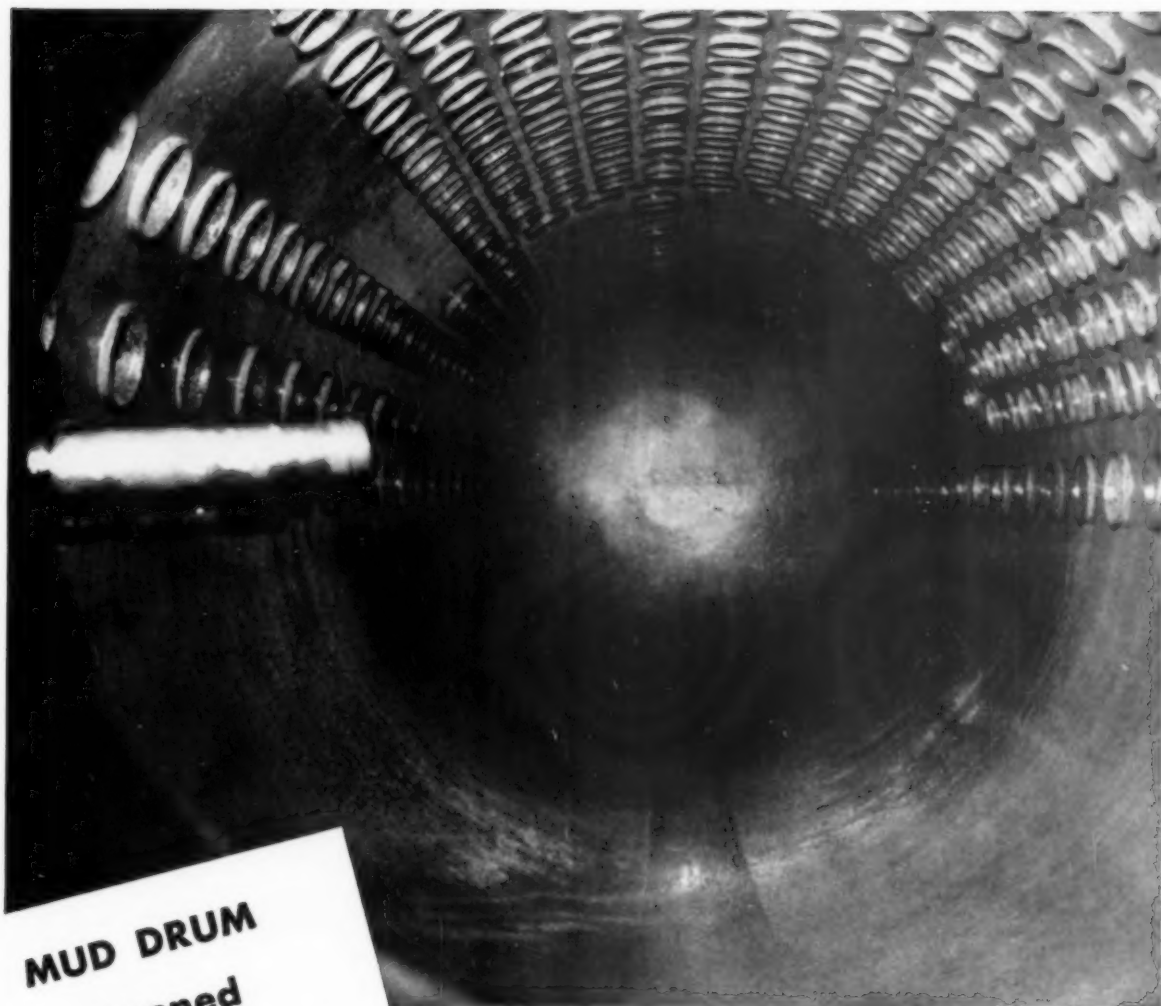
ALLIS-CHALMERS



SOUTHERN POWER & INDUSTRY is published monthly at 214 W. Morehead St., Charlotte 6, N. C., by W. R. C. Smith Publishing Co. Executive and Editorial Offices: 806 Peachtree St., N. E., Atlanta 3, Ga. Entered as second-class matter at the Post Office, Charlotte, N. C. Subscription Rates: United States and Possessions, \$1.00 per year or three years for \$2.00; Foreign Countries, \$10.00 per year.

Volume 74

Number 3



MUD DRUM
as opened
 after one year
 on line

with
THE Nalco
SYSTEM

*Unretouched photo of Nalco treated boiler at
 Georgia Institute of Technology, Atlanta, Georgia*

● Calling this a mud drum serves only to identify its location . . . it is perfectly clean after a full year on line. The unretouched photo was taken immediately after the drum was opened. No wash-out was necessary. Not only is the drum free of scale and corrosion . . . Nalco sludge conditioning operated so effectively that even under the static, off-line draining condition, no sludge deposited in tubes or drums.

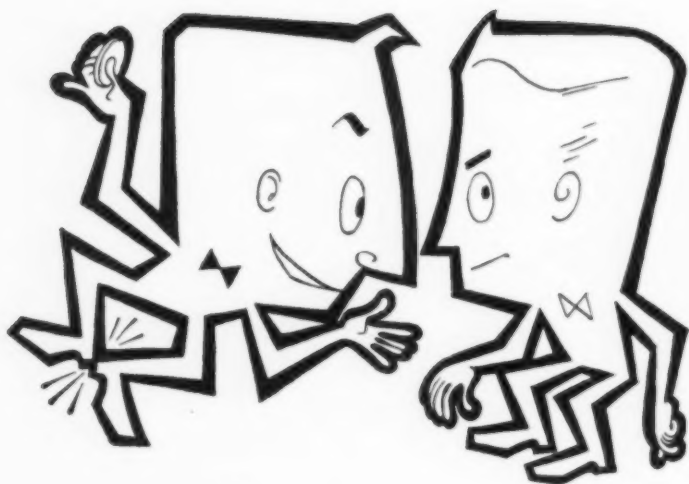
The Nalco System can get results like these, economically, in *your* plant—regardless of boiler size or pressure. Write or phone Nalco today for action on a complete water treatment program.

NATIONAL ALUMINATE CORPORATION

Telephone: PORTSMOUTH 7-7240
 6226 West 66th Place • Chicago 38, Illinois
In Canada: Alchem Limited, Burlington, Ontario

THE
Nalco®

SYSTEM . . . Serving Industry through Practical Applied Science



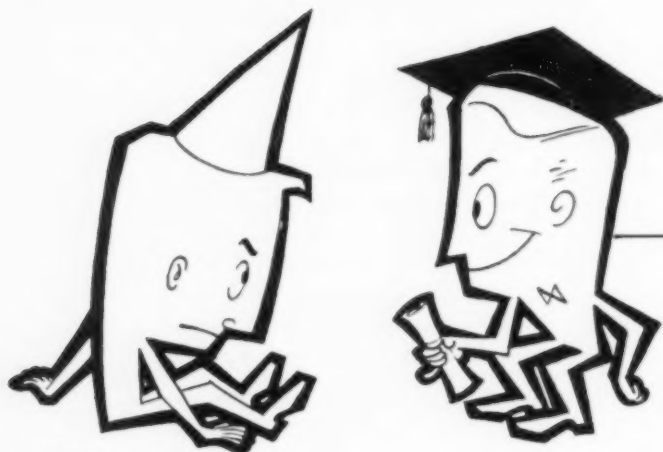
Look! I can buy coal for much less a ton than you're paying.

I used to buy that coal too, but it costs more per million BTU's with a whole lot more in hidden costs.



What do you mean by "hidden costs"?

That coal you're talking about is high in ash. So we were buying ashes at the coal price, paying freight on them from the mine, then paying to have them hauled away. Your "cheaper" coal clinkers; it smokes; it fouls the tubes. That means higher labor costs and higher maintenance. Now I pay more per ton and save thousands of dollars a year.



Coals produced on the C&O are tops in quality.

A C&O combustion engineer showed me why this grade of coal would work best in our type of installation and our experience has shown he was right. You'd better get some expert advice. It can save you money, too.



There's a lot more to buying coal than the cost per ton. Why not contact coal producers on the C&O to solve your particular fuel requirements, or write to: R. C. Riedinger, General Coal Traffic Manager, Chesapeake and Ohio Railway Company, Terminal Tower, Cleveland 1, Ohio.

Chesapeake and Ohio Railway

WORLD'S LARGEST CARRIER



OF BITUMINOUS COAL

SOUTHERN POWER AND INDUSTRY

Vol. 74
No. 3

MARCH, 1956



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Annual Subscription—\$1.00
Foreign—\$10.00

Published monthly by
W. R. C. SMITH PUBLISHING CO.
Atlanta, Ga., and Charlotte, N. C.

Publishers also of *Textile Industries*, *Electrical
South*, *Southern Hardware*, *Southern Auto-
motive Journal*, and *Southern Building Supplies*.

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Contents indexed regularly by Engineering Index, Inc.

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Editorial and Executive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E. ATLANTA 5, GEORGIA

Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

March 1, 1956

- ◆ **WORLD'S LARGEST** steam-electric plant has been completed near Kingston, Tennessee by TVA. Nine units total 1,600,000 kw. If operated at 80% load factor, plant would consume 11,750 tons of coal per day or over 4,000,000 tons per year. Circulating water pumps are capable of supplying 1,038,000 gpm from the intake channel.

Boilers—1,280,000 lb/hr at 1840 psig, 1053 F. and 88.46% efficiency. Turbo-Generators—200,000 kw maximum rating. Reheat to 347 psig and 1050 F. Turbine heat rate 7777 Btu.

Coal per kwh figures from several TVA plants show how much more efficient modern plants are than those built years ago. It takes two pounds of coal to produce one kilowatt-hour of power in an old steam plant at Nashville. Johnsonville Steam Plant, TVA's first big postwar job, uses .85 of a pound of coal to produce a kilowatt-hour of power. But TVA's new \$213 million Kingston plant uses only .78 of a pound per kilowatt-hour. Semi-technical highlights are featured in this issue.

- ◆ **ALL-AIR TUBE EXPANDER DRIVE** by Thomas C. Wilson, Inc., offers a control free from operating variables and maintenance problems and one that provides torque output calibrated in terms of foot-pounds instead of arbitrary units of measurement.
- ◆ **ALL-HYDRAULIC 3-TON OVERHEAD CRANE** is offering infinite variable speed control in a plant requiring average industrial crane service. Shaw-Box Crane & Hoist Div. of Manning, Maxwell & Moore, who designed and built the experimental model, estimate that the cost of the all-hydraulic crane will be approximately 10% less than comparable three-motored cranes.

Designs are completed for cranes up to and including 10-ton capacity—which covers about 65%-70% of cranes purchased. In addition to infinite variable speed under any load, manufacturers claim less maintenance than its multi-motored electric counterpart. For design details check "Equipment . . . Supplies . . . Methods" in this issue.

- ◆ **BIG WATER-USING INDUSTRIES** are eyeing Charleston, South Carolina, which will soon be offering 10 billion gallons of water daily to thirsty modern processing plants. "Never before has so much water been available for so little effort and money, and at a site accessible to ocean traffic."

The Santee-Cooper hydroelectric plant 40 miles upstream from Charleston was daily discharging 10 billion gallons of fresh water into Charleston harbor and out to sea. However, the flow was unfit for industrial use because salty sea water running up the Cooper River on each incoming tide contaminated it.

Far sighted engineers are now diverting the flow into Back River (short stream parallel to the Santee-Cooper River) by means of a canal. Back River will then be closed by an earth-fill dam at its lower end to form a barrier to block salt intrusion into the fresh water reservoir. Plus advantage is that the Cooper River, which borders industrial sites, offers a means of effluent disposal. Estimated cost is only about \$4.5 million. Completion scheduled for July, 1956.

(Continued on page 6)

POSITIVE PROTECTION *plus* GREATEST ECONOMY

NEW Consolidated Safety Valve cuts cost per pound of steam discharged...has maximum capacity designed into minimum flange size...reduces size and/or number of safety valve nozzles required on any boiler...saves installation and maintenance expense.

TYPE 1511
CAST IRON BODY
SAFETY VALVE



ACCEPTED by
top industry
as a proved
Consolidated
design.



Type 1511 is a new all-purpose Consolidated Safety Valve expressly designed for steam generator service. It's a space-saver . . . requires less headroom and smaller discharge piping. The spring is exposed to provide stable operation and uniform blowdown control. Greater tightness is assured because of the precision lapped flat seats. Integral, double-guided combination adjusting ring and disc guide contribute to better alignment, easy blowdown adjustment and finer performance. Full range of sizes and orifices available. Get the whole operational and economy story. Bulletin 730 has complete details. Write for a copy.

SIZES: 1½" through 6". **PRESSURES:** Up to 250 psi.
TEMPERATURES: Up to 450° F. All sizes except 6" available with oversize inlet flanges.

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

CONSOLIDATED SAFETY VALVES

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONN.

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'ASHCROFT' GAUGES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, Stratford, Conn. 'HANCOCK' VALVES, Watertown, Mass. 'CONSOLIDATED' SAFETY RELIEF VALVES, Tulsa, Okla. AIRCRAFT CONTROL PRODUCTS, Danbury & Stratford, Conn. and Inglewood, Calif. "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, Muskegon, Mich.

Facts and trends (continued from page 4)

- ◆ APPALACHIAN ELECTRIC will build their \$55 million, 450,000 kw Clinch River Plant in Western Virginia. Coal from the extensive Clinch Valley fields will provide the fuel for the plant's outdoor generating units.

New station will supply the territorial need for additional power, will be situated in the middle of a rich field of economical coal and will be able to utilize existing transmission lines to feed the bulk of its power to major load centers to the north.

The two Clinch River 225,000 kw generating units are sixth and seventh in a series of 225,000 kw machines currently being built on the AGE System: three in Virginia, two in West Virginia and two in Ohio. When completed, total generating capability of the AGE System will be 5,700,000 kw, of which Appalachian's portion will be almost 2,200,000 kw.

- ◆ WROUGHT IRON PIPING was extensively used in the recently constructed Bayou Lafourche Pumping Plant project at Donaldsonville, La. The plant, part of Louisiana's water resources development program, will help satisfy water requirements along Bayou Lafourche from the Mississippi River at Donaldsonville to the Gulf of Mexico.

More than 5,000 ft of 60-in. and 48-in. pipe, fabricated of wrought iron plate, is employed in intake and discharge line service at the Bayou Lafourche Plant. Four 470 ft, 60-in. O.D. pipe lines are installed in intake service from the Mississippi to the Donaldsonville pumping station; and four 48-in. O.D. discharge lines, 840 ft long, are laid from the pumping station to the Bayou.

Economic considerations, as well as the longer service life potential of wrought iron influenced the material selection. Lines could be constructed without the additional cost requirements of special protective coatings, wrappings, etc.

- ◆ NEW REYNOLDS METALS' \$75 to \$80 million aluminum reduction plant to be constructed at Listerhill, Alabama, will deliver aluminum in molten form direct to a new Ford Motor Company foundry to be built adjacent to it. Reynolds will deliver to Ford during the next 10 years an amount of primary aluminum expected to be in excess of 640 million pounds.

- ◆ THROUGHOUT THE SOUTH & SOUTHWEST the dynamic industrial trend continues—more money, payrolls, skilled labor, plants and power—all stemming from the favorable climate, the highly productive labor and the abundant raw materials.

In 1955, the South and Southwest saw the construction of over 2,500 new plants and additions of significant proportions. They were reported monthly in SP&I's INDUSTRIAL NEWS SERVICE—a free service exclusive to SP&I advertisers and their representatives in the South and Southwest. Highlights of these monthly reports are featured in every issue of SP&I—see "New Plants and Expansions."

- ◆ MAINTENANCE COSTS in power plants is a relatively unexplored field which offers the greatest opportunity for savings in total production costs.

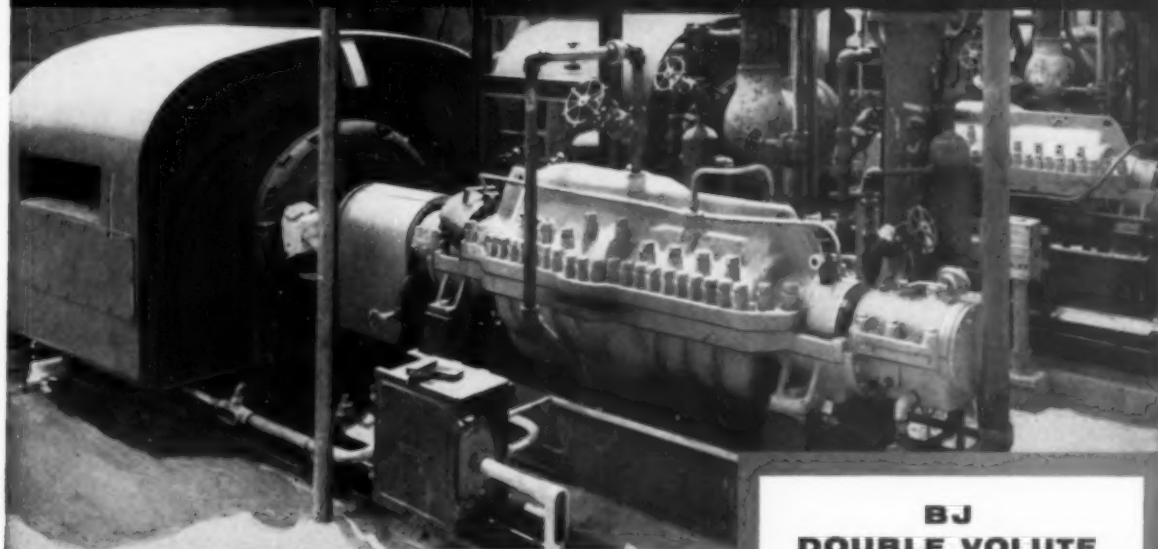
Some companies are putting major turbine inspections on a regular five-year basis. When dismantling equipment they find it less costly in the long run to keep enough men on hand to cope with every eventuality and to pay standby time than to call in additional men, or men of different skills, after finding out what is wrong.

Another utility lowered production costs by organizing its maintenance staff of about 450 men for all plants into one strongly centralized group, operating under one head.

Write the editors for additional information on any of the above items.
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.

NEW Byron Jackson DVMX SPLIT CASE BOILER FEED PUMP

...Engineered for Medium Size Power Plants



This new Byron Jackson DVMX split case pump gives the same trouble-free service that BJ barrel type Boiler Feed Pumps have been providing for the larger power plants in the United States for many years. This DVMX model is engineered primarily for medium-sized power plants and delivers capacities to 2200 gpm, heads to 1200 psig. and temperatures to 350° F.

Here's what you get in the new DVMX

1 Horizontally-split case, with both nozzles in the lower half of the pump case, permitting removal of the top half of the case and the complete rotating element without disturbing the piping.

2 Double volute design which assures radial balance of the pump at all capacities.

3 Impellers arranged in equally opposed groups, assuring hydraulic axial balance without resorting to the use of any auxiliary high pressure balancing devices.

4 Available with reliable BJ high pressure Mechanical Seal especially designed for boiler feed service.

5 Furnished with a spacer type coupling for easy removal of the mechanical seal.

6 The thrust and radial bearings including the self-contained oiling system are of the same reliable construction that has proven so successful over the years in the larger BJ barrel type Boiler Feed pumps. The oiling system is of ample size to supply the driver bearings if desired.

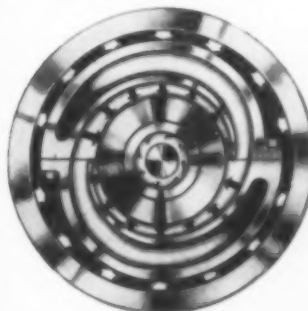
Byron Jackson

Division of Borg-Warner Corporation
P.O. 2017, Terminal Annex, Los Angeles 54, California

BJ

BJ DOUBLE VOLUTE

By the use of BJ Double Volute inner cases, the flow is divided into two identical fluid channels with outlets 180° apart. Equal opposing forces are created, resulting in radial balance without pressure-bending moment on the shaft.



BJ MAKES BOILER FEED HISTORY!

Byron Jackson is building the world's largest boiler feed pump. This 12,000 HP pump will deliver 6,330 gallons per minute at total head of 6,400 feet, or about 2700 pounds per square inch, at a speed of 3510 RPM.

New Plants — Expansions

- ✓ **Manufacturing Plants**
- ✓ **Utility Plants**
- ✓ **Large Service Plants**

Highlights for March, 1956

South Atlantic States

Sulphur recovery and polymerization plants underway for **Tide Water Associated Oil Co.** at **Delaware City, Delaware** . . . **Sanford Manufacturing Company** expanding with plant on 200 x 500 ft site in **Sanford, Florida** . . . **Cor-far Construction Co.** has begun work on new plant for **Futurionics Manufacturing Co.** at **St. Petersburg, Florida** which will employ about 400.

\$600,000 bottling plant in **Columbus, Georgia** planned by **Nehi Corporation** . . . **Monroe Auto Equipment Co.'s** \$2,000,000 branch plant at **Hartwell, Georgia** expected to be completed in March . . . 1957 completion scheduled for **Southern Nitrogen Co., Inc.'s** petrochemical plant in **Savannah, Georgia** . . . **Union Bag & Paper Co.'s** \$20,000,000 modernization and expansion program at **Savannah, Georgia** will be completed by mid-1958.

90,000 sq ft metalworking plant underway in **Brass-town, N. C.** will be operated by **Gustave Linseen, Inc.** . . . Construction in **Charlotte, N. C.** of the \$150,000 operational headquarters and warehouse for **Piedmont Natural Gas Co., Inc.** . . . **Unagusta Manufacturing Co.'s** \$800,000 furniture manufacturing plant going up in **Unagusta, N. C.** . . . **Wendell, N. C.** planning \$145,000 of improvements for the water and sewage systems.

Daniel Construction Co. erecting in **Easley, S. C.** a 350,000 sq ft metalworking plant for **Saco-Lowell Shops**, manufacturers of textile equipment and machinery . . . **South Carolina Electric and Gas Company** constructing \$19,000,000 steam electric generating station at **Irmo, S. C.**, with first unit operation in May, 1958 . . . **Newberry Mills, Inc.** planning million dollar expansion program at **Newberry, S. C.**, including new equipment and a plant addition . . . Construction underway by **Daniel Construction Co.** on **Albany Felt Company's** 100,000 sq ft building at **St. Stephens, S. C.** for the manufacture of papermaker's felts.

\$200,000 liquid aluminum sulfate plant in **Hopewell, Va.** for the **General Chemical Division of Allied Chemical and Dye Corporation** . . . Construction at **Lynchburg, Va.** on the \$100,000 pipe manufacturing plant for **Concrete Pipe and Products Co.** . . . June is scheduled completion date of the \$772,000 **Philip Morris, Inc.** building

at **Richmond, Va.** . . . **Riverton Lime and Stone Co.** plans construction of a \$10,000,000 Portland cement plant at **Riverton, Va.**, with operation scheduled early in 1957.

Dola, W. Va. will be the site of the \$1,500,000 coal preparation and drying plant for **Compass Coal Co.** which is hoped to be completed by July . . . \$1,000,000 expansion is being planned by **Carbide and Carbon Corp.** for its new silicone plant at **Long Reach, W. Va.**

East South Central

Florence Packing Co. doubling operating space in its \$100,000 expansion program at **Florence, Ala.** which is to be completed in March . . . \$400,000 building and warehouse in **Guntersville, Ala.** scheduled for completion in May for **Botkins Grain and Feed Co.** . . . **Reynolds Metals Co.** will construct \$75,000,000 aluminum-reduction plant in **Listerhill, Ala.** rather than the previously announced plans for **Ky.** . . . **Robert and Company** constructing a \$500,000, 60,000 sq ft garment factory in **Opelika, Ala.** for **Opelika Manufacturing Corporation** with operations to begin by June . . . **Tuscaloosa, Ala.** is the site for the 14,000 ft plant for **Delview Dairy** which is to be completed by June.

Tidewater Construction building **Cumberland Corporation's** \$2,400,000 charcoal briquets and furfural plant at **Burnside, Ky.** . . . **Electric Parts Corp.**, manufacturer of electric blankets, will move from Chicago into a new \$300,000 plant being constructed in **Georgetown, Ky.**

\$1,000,000 expansion program underway at **Crystal Springs, Miss.** for the **Mississippi Products, Inc.**, manufacturers of TV, radio and phonograph cabinets and various types of furniture . . . **Gulf-Naval Stores'** \$400,000 pressed board building materials plant at **Gulfpport,**

(Continued on page 10)

Data taken from SPI's SOUTHERN INDUSTRIAL NEWS SERVICE, issued exclusively to SPI advertisers and their representatives throughout the South and Southwest.

at famous Little America Tourist Court . . .

SPANG CW Steel Pipe Provides an Oasis in the Desert



MAINTEINING a water supply in the desert is a tough job. But Little America Tourist Court in the heart of the Wyoming Desert reports that SPANG CW Steel Pipe has stood up under desert conditions better than any other pipe they have ever used.

Two miles of SPANG CW bring in 30,000 gallons of spring water daily to Little America's underground storage tanks for cooking and drinking uses. SPANG Pipe is also used for natural gas lines and the five-hydrant fire-fighting system on the 640-acre site.

Fred Mauch, Little America's chief maintenance man, says: "That SPANG water line is really holding up. SPANG Pipe has lasted better than any we have tried."

Earl Holding, manager of Little America, adds: "Our SPANG-piped fire system paid for itself. Savings on the first three-year premium paid for the entire cost of the pipe, pumps and hydrants. And the SPANG Pipe from the spring supply to the main installation has been trouble-free in five years of operation!"

This is *quality-controlled* SPANG CW Steel Pipe in action . . . typical of the service you get from SPANG in any type installation. Try it and see! Write for the name of your nearest SPANG Distributor.

Located in the middle of the Wyoming desert on US 30, Covey's Little America is a haven for travelers and truckers. It grew from a boy's dream to a self-sufficient tourist city of 30 buildings, including lodges, gift shops, service station, dining room, soda fountain and cocktail lounge.

General Contractor: Cannon Construction Co., Salt Lake City
Plumbing Contractor: Smithfield Plumbing Co., Salt Lake City
SPANG Distributor: National Supply Store, Rock Springs, Wyoming



SPANG Pipe supplies water, natural gas and fire protection at Little America, the world's largest one-stop travel center. All piping systems reach their main control areas through this underground tunnel.

SPANG-CHALFANT

DIVISION OF THE NATIONAL SUPPLY COMPANY

General Sales Office: Two Gateway Center, Pittsburgh, Pa.
District Sales Offices: Atlanta, Boston, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis



New Plants & Expansions (Con't.)

Highlights for March, 1956

(Continued from page 8)

Miss., scheduled for production in April . . . \$3,400,000 dimension lumber factory underway on 30 acre site at **Meridian, Miss.** for **Kroehler Mfg. Co.** . . . Early 1957 completion expected for the \$18,000,000 petroleum processing plant at **Purvis, Miss.** for **Pontiac Eastern Corp.** and **Gulf Refining Co.**

C. & O. Manufacturing Company will move from its quarters in Cleveland into its new chair and upholstered furniture plant at **Benton, Tenn.** . . . \$250,000, 10,800 sq ft hot dip galvanizing plant nearing completion on a 12 acre site at **Nashville, Tenn.** is a branch of **Boyles Galvanizing Company** of Tulsa . . . Spring completion anticipated for the **Shelbyville, Tenn.** \$150,000-\$200,000 factory and warehouse of the **Empire Pencil Co.**, a subsidiary of **Hassenfield Brothers.**

West South Central

Plans call for a 125,000 sq ft addition in 1956 and another in 1957 to **Eastern Metal Products Corp.**'s presently incompleted plant in **Ft. Smith, Ark.** . . . Spring will see the beginning of **Dierks Forests, Inc.**'s kraft paper mill, **Dierks Paper Company**, which will be built by **Rust Engineering Co.** at **Pine Bluff, Ark.** and which should be completed by mid-1957.

Mechanics Overall Service constructing a \$400,000 manufacturing plant in **Alexandria, La.** for the production of fender covers, wiper towels, overalls, shirts, pants and coveralls which will be completed in July . . .

\$2,000,000 expansion program underway for **Columbia-Southern Chemical Corp.** at **Lake Charles, La.** should be completed by the Spring of 1957 . . . Construction at **Lake Charles, La.** of **Firestone Tire and Rubber Company's** 40,000,000 ton-per-year butadiene producing plant.

Chemical Construction Co. of New York, a subsidiary of **American Cyanamid Co.**, is designing the **defense department's** \$20,000,000 chemical plant at **Pryor, Oklahoma** for the manufacture of nitroguanidine, a shell propellant — July, '57 scheduled completion.

\$1,500,000 expansion program is underway for **University Power Plant** at **Austin, Tex.** . . . **Hobbs Trailer** erecting \$175,000 plant on 100 acre site at **Cleburne, Tex.** . . . \$1,000,000 valve-making factory underway at **Nacogdoches, Tex.** for **North Indiana Brass Company** . . . **El Paso Natural Gas Co.** and **General Tire and Rubber Co.** have consolidated to construct a \$30,000,000 synthetic rubber operation at **Odessa, Texas.** . . . \$1,000,000 asphalt refinery will be completed by mid-1956 for **Texas Asphalt and Refining Co.** at **Pasadena, Tex.** . . . \$500,000 plant of **Robstown Clay Products Company** is underway at **Robstown, Tex.** . . . **City Public Service** board's **Mission Road Power Plant** at **San Antonio, Tex.** will undergo a \$12,000,000 three year revamping and expansion program.

Kansas and Missouri

Western Light & Telephone Company, Inc. anticipates \$2,000,000 expansion and improvements during 1956 in the vicinity of **Caldwell, Kans.** . . . \$3,000,000, 20,000 kw generating unit is planned for completion in 1957 at **Ft. Dodge, Kans.** . . . **Central Kansas Power Company** has begun its \$2,000,000 expansion program at **Hays, Kans.** . . . **Liberty, Mo.** will be the site of the \$170,000 propane plant which has been proposed for construction by **Central West Utility Company.**

FUTURE EVENTS of Engineering Interest

SOUTHERN SAFETY CONFERENCE, INC., W. L. Groth, Executive Director, Box 8927, Richmond 25, Virginia.
March 4-6, 17th Southern Safety Conference and Exposition, Biltmore Hotel, Atlanta, Georgia.

ELECTRICAL CONFERENCE as applied to pulp and paper industry being sponsored by Jacksonville, Florida, section A.I.E.E. and College of Engineering of University of Florida.
March 8-9, Conference on Electrical Engineering, University of Florida, Gainesville, Florida.

SOUTHEASTERN ELECTRIC EXCHANGE, John W. Talley, Haas-Howell Bldg., Atlanta, Ga.
March 12-14, Annual Meeting, Boca Raton Hotel and Club, Boca Raton, Fla.

AMERICAN SOCIETY OF TOOL ENGINEERS, Harry E. Conrad, Exec. Sect., 10700 Puritan Ave., Detroit 21, Mich.
March 19-23, Annual Meeting and Exposition, International Amphitheatre, Chicago, Ill.

AMERICAN POWER CONFERENCE, Illinois Institute of Technology, Technology Center, Chicago 16, Ill.
March 19-23, 18th Annual American Power Conference, Hotel Sherman, Chicago, Ill.

OKLAHOMA UTILITIES ASSOCIATION, Kate A. Niblack, Secretary, Suite 2415, Oklahoma Biltmore Hotel, Oklahoma City 2, Okla.
March 22-23, Annual Convention, Oklahoma City, Oklahoma.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, C. E. Davies, Secretary, 29 West Thirty-Ninth St., New York 18, N. Y.
April 1-5, Oil and Gas Power Division Conference, Jung Hotel, New Orleans, La.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, H. H. Henline, Secretary, 33 West 39th St., New York 18, N. Y.
April 2-4, Southwest District Meeting, Dallas, Texas.

INSTRUMENT SOCIETY OF AMERICA, Richard Rimbach, Secty., 921 Ridge Ave., Pittsburgh 12, Penna.
April 5-7, I.S.A. Regional Show, Birmingham, Ala.

ILLUMINATING ENGINEERING SOCIETY, A. Dexter Hickley, Exec. Secty., 51 Madison Ave., New York 10, N. Y.
April 5-7, Southern Regional Conference, Birmingham, Ala.
April 8-10, Southwestern Regional Conference, Hilton Hotel, Fort Worth, Texas.

AMERICAN WELDING SOCIETY, 33 West 39th St., New York 18, N. Y.
May 9-11, Fourth Welding Show, Memorial Auditorium, Buffalo, N. Y.

SOUTHEASTERN INDUSTRIAL EXPOSITION, Roger E. Montgomery, Managing Director, Lakewood Park, Atlanta, Ga.
May 18-25, Southeastern International Industrial Exposition, Lakewood Park, Atlanta, Ga.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, C. E. Davies, Secretary, 29 West Thirty-Ninth St., New York 18, N. Y.
Sept. 23-26, Petroleum-Mechanical Engineering Conference, Conrad Hilton Hotel, Dallas, Texas.

NEWS

Ross Joins Southern Branch of The Fairbanks Company

William B. Ross has been appointed to the Alabama-Tennessee territory of The Fairbanks Company.



Mr. Ross, a graduate of the University of Wyoming and an Air Force Veteran, comes to the company with a background of machinery sales to dealer organizations. In his new assignment, Mr. Ross will sell the complete Fairbanks line — bronze and iron body valves, casters and wheels, two wheel and platform hand trucks and the Dart unions and union fittings.

James J. Ragland is Manager of The Fairbanks Company Southern Area branch office and warehouse with headquarters in Rome, Georgia.

Beyer Sylvania Sales Mgr. of Charlotte, N. C. District

Charles C. Beyer has been appointed district sales manager, lighting products, for the newly formed Charlotte, N. C. district by Sylvania Electric Products, Inc. The district includes North and South Carolina, Kentucky, Virginia, and Tennessee. He will make his office in Charlotte at 225 South Tryon Street.

Mr. Beyer joined Sylvania in 1949 as a lighting sales representative in the Philadelphia district, and later served with the company's Washington, D. C., sales group. Early this year, he was appointed district sales manager of the Philadelphia area.

(Continued on page 14)



WHY NOTHING PROTECTS LIKE Subox PAINT

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See Catalogues in Sweet's Industrial and Engineering Files

*Trade Mark



This plant is safer since they put these Crane valves on hazardous fluids

THE CASE HISTORY—How safely you handle hard-to-hold combustible fluids can depend on the valves you use. Read how a large Midwestern printing and binding plant, by changing to the right valves, encouraged employee care and safety while stopping hazardous leakage and waste.

The plant's supplies of kerosene, naphtha, benzol and similar fluids were stored in a fireproof room. But the danger was in the constant dripping and leakage at the tanks.

The original pump apparatus on the drums was discarded and ordinary valves were installed for drawing supplies. Still the hard-to-

hold fluids dripped and leaked—through the valve packing and stuffing box, and at the seats. Fluids were lost . . . the high maintenance costs continued . . . and the unsafe conditions remained.

Changing to Crane No. 130 brass valves on the drum outlets stopped all previous trouble.

To-date they've given more than a year of leak-free, maintenance-free service. These valves have special features for handling light oils, gases and volatile fluids.

Underwriters' Laboratories approved for LP-gases, Crane No. 130 valves have a composition disc soft enough for tight seating, yet stiff

and resilient to take hard wear. The disc, cemented in its holder, prevents around-the-disc leakage. The stuffing box with molded asbestos packing is extra deep for durable stem sealing.

No. 130 valves are typical of Crane quality and value, and the complete selection you have in the Crane line in valves and fittings for every flow control need.

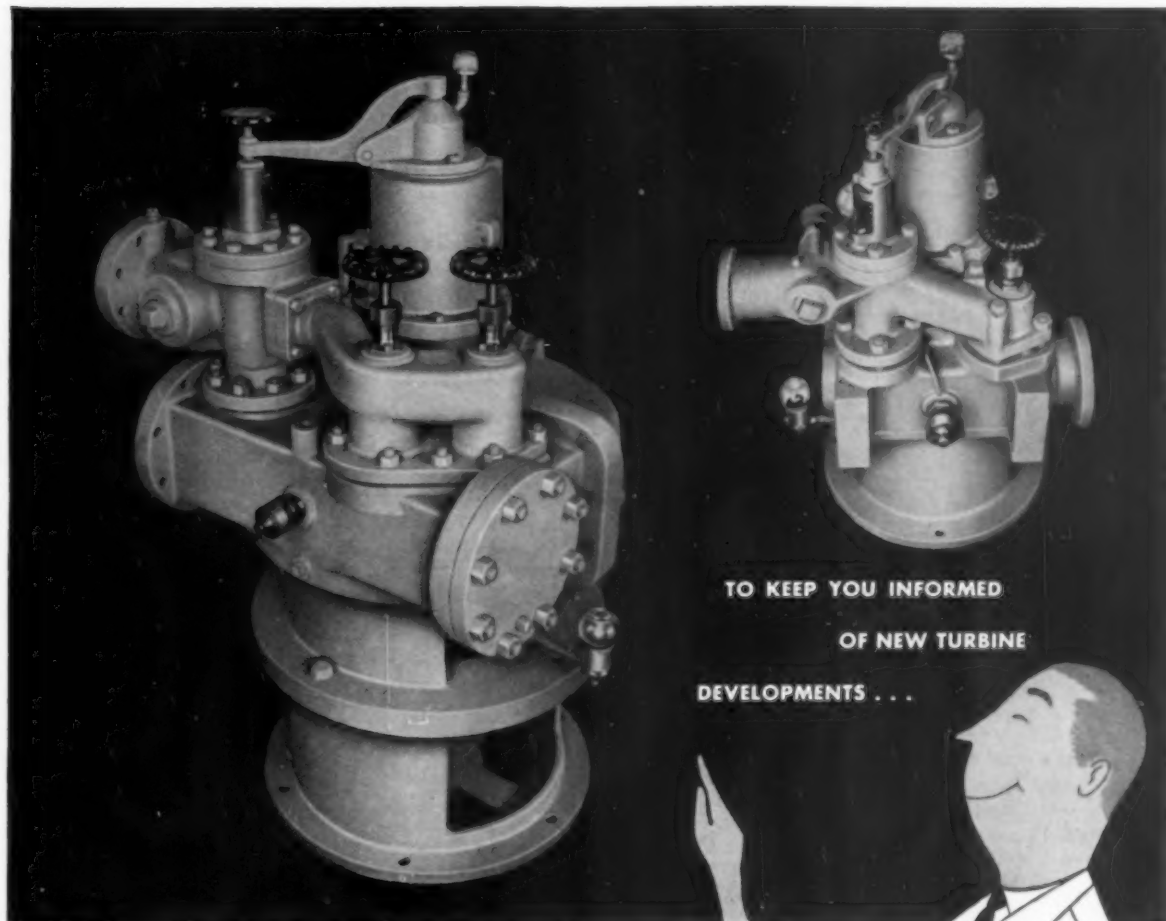
You'll find that specifying and ordering Crane materials will lead to lower ultimate costs for your piping equipment.



CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas



Here are a few of the many improved features which help make the new Dean Hill Vertical Turbines your best power-package buy:

- 1 MORE POWER**—An added steam nozzle for Models DH-10V (new in vertical line) and DH-20V increased power 100% over former one-nozzle counterparts. The DH-30V now has three steam nozzles and 50% more power.
- 2 BETTER PERFORMANCE**—Two hand valves improve regulation of steam rate at reduced load. Improved packing boxes check steam pressure leakage and permit higher back pressures.
- 3 LONGER SERVICE**—Double-row ball bearing has greater thrust capacity. Overlapping labyrinth slinger on lower bearing prevents moisture seepage.
- 4 POSITIVE SAFETY**—Improved emergency trip mechanism has cylindrical guide to maintain alignment of trip valve stem in all positions.



MORE DETAILS?

You will want to study the other improvements in the DH Line... improvements made to increase the useful life and efficiency of the turbine without sacrificing the compactness and simplicity of design. Write now for our new Catalog No. 500, which includes full details on both Vertical and Horizontal DH Turbines.

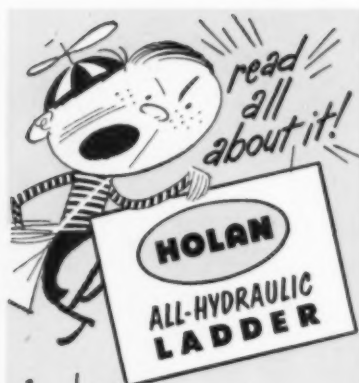
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News for the South & Southwest (Continued)

Diamond Alkali Changes South and Southwest

Appointments to five new managerial and administrative positions in **Diamond Alkali Company's** newly-formed **Electro Chemicals Division** have been announced by Frank Chrencik, General Manager of the Division.

Wilburn J. Butler, Assistant Works Manager at Diamond's Deer Park Plant at **Houston, Texas**, for the past two years, becomes Works Manager.

Jack R. Horacek, Assistant Works Manager at Diamond's **Muscle Shoals** Plant since November, 1954, takes over the duties at Deer Park relinquished by Butler.

James H. Fall, Jr., for the past eight years Superintendent of Diamond's Edgewood Plant, succeeds Horacek at Muscle Shoals.

Edward I. Fogelman, Assistant Superintendent at Edgewood since mid-1954, moves up to Superintendent, replacing Fall.

Ralph H. Parsons, presently Inorganics Chemicals Production Manager at Deer Park, becomes staff assistant to Chrencik, assisting him in coordinating the new division's electrolytic operations at five plants (Houston; Edgewood, Maryland; Muscle Shoals, Alabama; Pine Bluff, Arkansas; Painesville, Ohio). Parsons will be located at Diamond's general offices in Cleveland.

pany, Inc., of Linden, New Jersey, manufacturers of stainless steel valves; and, **Southwest Fabricating & Welding Company, Inc.**, of Houston, Texas, fabricators of carbon and alloy steel pipe for the gas, petroleum and petrochemical industries.

Southeastern District Manager for Morse Chain

Raymond H. Whitney has been appointed Southeastern District Manager for the **Morse Chain Company's** complete line of power transmission products.



Mr. Whitney has been engaged in the sale of power transmission products for the past 14 years, and has had extensive experience in southern tobacco, textile and paper operations, as well as in the general industrial field. Mr. Whitney will headquarter in **Charlotte, North Carolina**.

Walworth Acquires Conoflow

As its fourth major acquisition within six months, **Walworth Company**, nation-wide manufacturers of valves and pipe fittings, has completed purchase of all of the outstanding common stock of the **Conoflow Corporation**, Philadelphia, a leading producer of pneumatic automatic valve control equipment. Conoflow will be operated as an independent subsidiary without change in management, employees or present policy.

Previous acquisitions as operating subsidiaries include: **The M & H Valve & Fittings Company** of Aniston, Ala., makers of valves and fittings for industrial sprinkler systems, waterworks and sewerage systems; **Alloy Steel Products Com-**

Sylvania District Sales Manager, Washington, D. C.

Noel C. Bride has been promoted to district lighting sales manager of the **Washington, D. C.**, district by **Sylvania Electric Products, Inc.** He will make his headquarters at the company's offices at 2520 Oakville Street, Alexandria, Va.

Mr. Bride succeeds G. Dallas Rand, who was recently appointed manager of government lighting sales by Sylvania.

More News — Page 86

SERVICE is our business

ALTHOUGH we are in the pipe and tubing business, we don't limit ourselves to manufacturing and selling our product.

We have an important service to perform . . . a service which we feel is almost an obligation; that of making certain you get the *right* pipe or tubing for every installation—at the lowest cost to you.

The next time you are in the market for tubing, get in touch with National Tube—*before* you buy. We have a technically trained Mill Service Force available to you for technical and operating assistance in meeting your tubular requirements. This Force is also available for consultation in the field. We'll be glad to evaluate your installation specifications and to recommend the material that will best meet the job requirements. The selection of the right tube for the job may save you money. And incidentally, our recommendation won't cost you a cent.

National Tube manufactures seamless pipe and tubes in a complete range of steel analyses from low carbon, through the alloys up to and including stainless steels. A wide range of sizes and wall thicknesses are available for every mechanical and pressure purpose. Let us hear from you.

*See The United States Steel Hour. Televised alternate weeks.
Consult your local newspaper for time and station.*



NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
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UNITED STATES STEEL

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—INDEX OF HELPFUL BOOKLETS, BULLETINS, REFERENCE LITERATURE—

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STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

1 PACKAGE BOILER — Bulletin DK-1 describes Keeler's newest compact, low cost package unit (oil or gas fired) for small space requirements. Pressures to 325 psi, steam capacities to 45,000 lb/hr. — E. KEELER CO., Williamsport, Penna.

9 FREE COAL COUNSELING — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose. — NORFOLK AND WESTERN RAILWAY.

25 PACKAGED BOILERS — New bulletin PSG-2 shows construction details and table of capacities, dimensions and weights for nine sizes of units. — HENRY VOGT MACHINE CO.

29 CONTINUOUS BLOW-OFF — Bulletin, 8 pages — Gives the basic facts about boiler blow-off, and describes the Madden system of control of continuous blow-off for the removal of solids and impurities from steam releasing surfaces. — THE MADDEN CORPORATION.

35 UNIT STEAM BOILERS — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions. — CLEAVER-BROOKS CO.

41 PACKAGED DRAFT INDUCER — Bulletin I-55 — Shows how space problems can be solved by the company's packaged power plant draft inducer. Units may be turbine or motor-driven. Fan and bearing assembly may be withdrawn from housing for inspection and servicing. — L. J. WING MFG. CO.

46 AIR PREHEATERS — Bulletin "The Ljungstrom Air Preheater," 36 pages — Explains fuel savings and

increased performance possible by using waste heat in flue gases to preheat incoming combustion air. Explains operation, construction and economy of gas-to-gas preheaters of the continuous regenerative type. — THE AIR PREHEATER CORP.

56 WATER TUBE BOILERS — Booklet — Describes details of stoker — oil or gas or combination gas/oil, 10 to 350 hp to 250 psi; designed for easy conversion to any fuel. — QUEEN CITY ENGINEERING COMPANY, INC.

87 STEAM TURBINES — Single Stage — Bulletin 900 describes features and characteristics of company's type DH steam turbines in horizontal and vertical models. — DEAN HILL PUMP COMPANY, INC.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

108 ACTIVE AIR — Catalog 2046 shows how to put active air to work in buildings and shops. Direct drive exhaust fans, air circulators, and ceiling fans. — EMERSON-ELECTRIC.

120 CONTINUOUS BLOW-OFF SYSTEM — Publication 4081 — The savings possible through continuous blow-off as applied in many modern boiler plants. — COCHRANE CORP.

126 MOTOR PUMP — Catalog 7095-A — Gives a complete story of the application, characteristics, types, sizes & other data of Ingersoll-Rand motor pumps from $\frac{1}{4}$ to 40 hp, from 10 to 1800 gpm, from 0 to 600 ft head single and multistage. — INGERSOLL-RAND CO.

165 AFTER-COOLER — Bulletin 130 describes cooler for plant utility air systems. Reduces compressed air temperatures to below ambient. Self-contained method replacing both shell-and-tube cooler and cooling tower. — NIAGARA BLOWER COMPANY.

168 SEALS FOR PUMPS — Bulletin 49, 12 pages, describes the three types of Byron Jackson mechanical seals for centrifugal pumps — designed for sealing stuffing boxes of pumps handling hot and cold liquids, either corrosive or non-corrosive. — BYRON JACKSON DIV., BORG-WARNER CORP.

INSTRUMENTS—METERS CONTROLS—REGULATORS

203 OPEN CHANNEL FLOW METERS — Bulletin M22-5, 12 pages — Describes principle of operation and engineering features of Bailey Type FF meter which measures the flow of liquids with suspended solids for water supply and waste treatment applications in industrial plants. — BAILEY METER COMPANY.

204 FLOATLESS LEVEL CONTROL — Data sheets PC-37 describe control that is unaffected by surface agitation and equipment vibration. Simple, compact, one adjustment unit. — LESLIE CO.

205 DRAFT GAGES — Bulletins describe inclined, vertical tube, air filter gages, straight line and dial pointer type, mini-draft and receiver type gages, velocity gages and pitot tubes, gas analyzers and steam calorimeters. — ELLISON DRAFT GAGE CO.

211 FLUID CONTROL VALVE — Bulletin CV-1 describes "Bellofram" construction where no force is lost at end of the stroke where spring compression requires maximum force. Sizes start at $\frac{1}{4}$ ". — FOSTER ENGINEERING COMPANY.

212 AUTOMATIC TEMPERATURE CONTROL — Data sheets describe versatile automatic indicating temperature control offering many sequence combinations — step-heating, heating and cooling, wide limit control, or temperature control plus operation of signal devices. — SARCO COMPANY, INC.

271 FEEDWATER REGULATORS — Bulletin 1009, Catalog — Describes the complete Copes line of boiler feed regulators, pump governors, pressure reducing valves, balanced valves, desuperheaters, liquid level controls and Hi-Lo water alarms. — COPES-VULCAN DIVISION, BLAW-KNOX CO.

290 PROCESS TROUBLESHOOTER — Bulletin 6-A describes the Panalarm Visual Sequence Annunciator, which flashes cause of trouble, resultant off-normals, and provides means of grouping and acknowledging related variables so that minimum interpretation is required. — PANELLIT, INC.

PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

300 CAST IRON WELDING — Data sheets describe the new Xyron 2-25 strontium-aluminum bearing electrode for crack-free welding of gray and ductile cast iron, including Meehanite, Ni-Resist, and for joining cast iron to steel. — EUTECTIC WELDING ALLOYS CORP.

306 GRAPHIC PANELS — Bulletin PI-163, 4 pages — Shows typical applications of graphic control panels in power plants, petroleum, chemical and process industries. The techniques of graphic symbolism are illustrated, as well as the graphic panel components. — PANELLIT, INC.

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326 GRATING — FLOORING — Catalog, 12 pages — Gives picture story of "Weldforged" steel grating, flooring and stair treads — continuous spiral cross bars, alternating right and left, and slightly above bearing bars, electronically weldforged into inseparable units to insure greater non-skid protection and durability. — KERRIGAN IRON WORKS, INC.

328 WELDING STAINLESS STEEL — 52 page Booklet contains valuable data on the welding, brazing, soldering and hot cutting of stainless steel. — WAREHOUSE DIVISION, ATLANTIC STEEL COMPANY.

352 ELECTRIC PRECIPITATORS — Booklet — Describes the various types and applications of Cottrell electrical precipitators for the collection of solid and liquid matter suspended in hot or cold gases, with complete engineering data and illustrations. — WESTERN PRECIPITATION CORP.

370 WELDING ROD GUIDE — 31 page DirectoRod Guide helps you select from 160 rods those that will give you the largest savings per job, whether production, maintenance or salvage. — EUTECTIC WELDING ALLOYS CORP.

PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

402 FORGED STEEL VALVES — 32 page supplement of Catalog F-9 covers new general purpose gate, globe and angle valves for 150-800 lb services. Featuring hard faced seating surfaces. — HENRY VOGT MACHINE CO.



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328	352	370	402	410	415	432	433	435	480	491	500
511	518	583	596	602	603	631	657	694	700	703	704
706	712	801	830	838	841	871	900	904	927	936	937
998	0-1	0-2	0-3	0-4	0-5	0-6	0-7	0-8	0-9	0-10	0-11
0-12	0-13	0-14	0-15	0-16	0-17	0-18	0-19	0-20	0-21	0-22	0-23
0-24	0-25	0-26	0-27	0-28	0-29	0-30	0-31	0-32	0-33	0-34	0-35
0-36	0-37	0-38	0-39	0-40	0-41	0-42					

Also send further information on following New Equipment (page 70).

C-1 C-2 C-3 C-4 C-5 C-6 C-7 C-8 C-9 C-10 C-11

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410 PIPE HANGERS — Bulletin 153, 12 pages — Describes National counterpoise pipe hangers for high temperature piping systems in steam plants, refineries, chemical plants, and the like. Graphs give aid in selection. Dimensions, erection and field adjustment instructions. Illustrations of typical installations. — **NATIONAL VALVE & MANUFACTURING COMPANY.**

415 WELDING PIPE FITTINGS — New catalog illustrates where to use Weldolet and Thredolet branch pipe fittings. Specific areas of application shown with correct installation procedure. Describes complete range of stainless, alloy and non-ferrous fittings and Bonney's new marking standard. — **BONNEY FORGE & TOOL WORKS.**

432 ALUMINUM JACKETING—Data sheets describe low first-cost, long life jacketing for weatherproofing of insulated lines, towers, vessels and tanks. Lap-Seal design feature makes more positive weather seal. — **CHILDERS MANUFACTURING COMPANY.**

433 RENEWABLE SEAT RING GATE VALVE — Folder shows how you can replace seat rings in less than 10 minutes with valve body still installed in the line. 200 lb valves available in sizes ½" thru 2". — **THE FAIRBANKS COMPANY.**

435 VESSEL INSULATION — Bulletin 541 gives specifications for Copr-fibre blanket insulation and metal jacketing. Low initial cost; higher insulating efficiency; and less repair at lower cost. — **FORTY-EIGHT INSULATIONS, INC.**

480 PIPING FLEXIBILITY ANALYSIS — 12 page booklet shows how various flexibility analyses techniques can cut piping design and construction costs. — **THE M. W. KELLOGG COMPANY.**

491 CONTROL VALVES — Catalog 1500-B, illustrated — Describes complete line of Domotor, solenoid-operated and handwheel single seat control

valves for handling difficult fluids under extremes of temperature and pressure. Offers full, unrestricted flow, positive plug and seat alignment and directional flow flexibility. — **THE ANNIN COMPANY.**

MAINTENANCE PACKING GASKETS, LUBRICATION

500 LININGS & COATINGS — Brochure 7008, 4 p. describes company's rubber, neoprene and polyvinyl chloride lining and coating service for pipes, valves, tanks, ducts, vessels, etc. Provide protection against corrosion and abrasion in handling acids, bases, salts and fumes; coatings conductive or non-conductive, soft or hard, suitable for high or low temperature operations. — **RADIATOR SPECIALTY CO.**

511 MAINTENANCE IDEAS—"Genius at Work" — Contains ideas about plant maintenance, bits of philosophy, new products and a description of the company's line. — **KANO LABORATORIES.**

518 PACKINGS & GASKET CUTTERS — Catalog, 50 pages — Describes "The Packing That Packs All," manufactured in a variety of forms such as coil, spool, loose, rings, sets, spiral, and sheet. Designates materials available. Covers gasket cutters and related items. Illustrated with photographs and drawings. — **THE ALLPAX COMPANY, INC.**

583 CONDENSATE CORROSION — Bulletin No. 35, 4 pages — Describes the causes of condensate corrosion
(Continued on page 20)

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511	518	583	596	602	603	631	657	694	700	703	704
706	712	801	830	838	841	871	900	904	927	936	937
998	0-1	0-2	0-3	0-4	0-5	0-6	0-7	0-8	0-9	0-10	0-11
0-12	0-13	0-14	0-15	0-16	0-17	0-18	0-19	0-20	0-21	0-22	0-23
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how the package

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Where to Get It and How to Do It (Continued)

in return lines, heaters, tanks and describes methods of stopping it with various Nalco products. Well illustrated. — NATIONAL ALUMINATE CORP.

596 TUBE CLEANERS & EXPANDERS — Catalog 77 covers tubes in high pressure boilers, superheaters, economizers and other heat exchange equipment. Model 38 expander rolls and flares in single operation. — THOMAS C. WILSON, INC.

ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

602 TRAMRAIL SYSTEMS — 12 page Booklet 2008-L covers principal components used in tramrail systems, stresses developed in tracks, and track peening and its solution. Gives case study illustrations. — CLEVELAND TRAMRAIL DIV.

603 MONORAIL CASE STUDIES — File F-1 — Offers 20 new studies of engineered monorail applications in various industries. Factual information, complete with photos and plain drawings. — AMERICAN MONORAIL CO.

631 SCREW CONVEYORS — Catalog ID-541, 68 pages — Illustrates and describes standard and special types of conveyors, with engineering data necessary for selection. Tables give sizes, types, speeds, horsepower and other information. Accessories included. — CONTINENTAL GIN COMPANY, INDUSTRIAL DIVISION.

657 MATERIALS HANDLING — Catalog T-54, 34 pages — Gives structural details, specifications, engineering data, photographs on over fifty models of Fairbanks two-wheel and platform trucks, including hand trucks, steel framed platform trucks, lift jack platform trucks, wagon trucks and dollies. — THE FAIRBANKS CO.

694 STOCK ROLLER CHAINS AND SPROCKETS — Catalog No. 754, 66 pages — Describes and illustrates Stock roller chains and sprockets including minimum and finished bore, ready-to-use Taper-Lock bushed sprockets, as well as chain selection and application data. — DIAMOND CHAIN COMPANY, INC.

WATER TREATMENT, HEATING, VENTILATING, AIR CONDITIONING, REFRIGERATION, DUST & FUME CONTROL

700 WATER CONDITIONERS — 4 p brochure describes Anco water conditioners for hot-water and humidify-

ing systems. Stop rust and corrosion; prevent discolored water. — ANDERSON CHEMICAL COMPANY, INC.

703 AIR CONDITIONING — Bulletins 112 & 122 describe "controlled humidity" method where cooling and heating functions are made completely separate from adding or taking away moisture. No moisture sensitive instruments needed in flexible and compact design. — NIAGARA BLOWER CO.

704 WATER CONDITIONING — Brochure describes company's engineering services — zeolite water softeners, filters and purifiers, modernized and rebuilt water softeners, aerators and degasitors and process and boiler water conditioning. — SOUTHERN WATER CONDITIONING, INC.

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712 ION EXCHANGE EQUIPMENT — Bulletin A-255 describes the various methods of ion exchange treatment which provide suitable boiler feedwater, process water, and purified solutions. — ILLINOIS WATER TREATMENT CO.

ELECTRICAL

801 MOTORS — Bulletin describes and catalogs more popular a.c. motors from 1 to 500 hp, for every process and manufacturing requirement. Single phase and polyphase; surpass NEMA specifications. — BROOK MOTOR COMPANY.

830 MANUAL MOTOR STARTER — Bulletin 609 — Describes a manual starter available in enclosures for general, waterproof, dust tight and hazardous locations — with quick-make and quick-brake silver alloy contacts and double overload, breakers. — ALLEN-BRADLEY CO.

838 ELECTRIC POWER DRIVES — Scale Drawings, 22 sheets — Illustrate and describe geared, electric power drives for design engineers, draftsmen and layout engineers. Three views are detailed on each sheet with the frame and type drawn to three separate scales, from ½ hp to 30 hp capacity. — STERLING ELECTRIC MOTORS, INC.

841 APPLYING ELECTRIC HEAT — "101 Ways to Apply Electric Heat" — Gives illustrated case histories showing experience-tested methods of applying Chromalox electric heating elements. Physical aspects of installation are shown along with the description of the problem, solution and advantage obtained. — EDWIN L. WIEGAND CO.

871 ELECTRICAL PROTECTION — Protection Handbook — Tells how to protect motors, apparatus and circuits. Gives National Electrical Code requirements in simplified form. Designed to help the electrical or plant maintenance engineer. — BUSSMANN MFG. CO.

MISCELLANEOUS . . . SAFETY, BUILDING EQUIPMENT, METALS

900 HYDRAULIC AERIAL LADDERS — Catalog outlines features of Series 2100 all-hydraulic ladder, which rotates 360 degrees, reaches up to 40 ft in the air and elevates to 75 degrees. — J. H. HOLAN CORPORATION.

904 STEEL GRATING AND STAIR TREADS — 12 page catalog — Shows "Weldforged" steel construction and application — spiral crossbars, alternating right and left and slightly above bearing bars, electrically weldforged into one unit to insure greater non-skid protection and durability. — KERRIGAN IRON WORKS, INC.

927 FLOOR GRATING — Catalog No. AT254 — Describes company's free planning and checking service for completely custom fabricated floor grating installations. — BORDEN METAL PRODUCTS CO.

936 STOCK & WEIGHT HANDBOOK — 84 pages — Gives complete information on all sizes and shapes of stainless and carbon steel products normally carried by steel warehouses. Useful charts and tables. — WAREHOUSE DIVISION, ATLANTIC STEEL COMPANY.

937 STEEL MEASURING TAPES — Complete catalog describes full line of measuring tapes from 6 to 100 ft, including wide blade tape with upright measurements. — EVANS RULE CO.

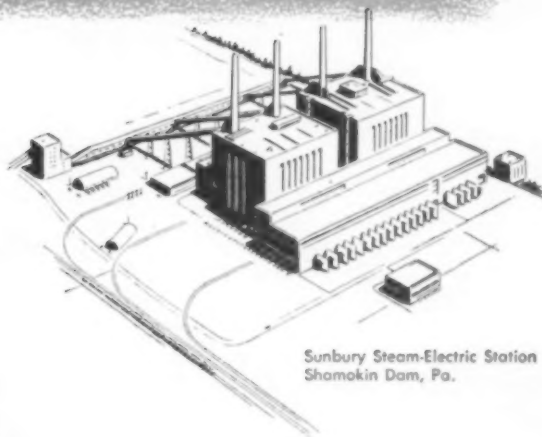
998 FORGING AHEAD IN BUSINESS — 48 p book on problems of personal advancement. Shows how to improve your position and increase your income. Outlines executive qualifications in today's competitive market. — ALEXANDER HAMILTON INSTITUTE.

PENNSYLVANIA POWER & LIGHT COMPANY

... an exclusive user of
Grinnell
prefabricated piping
for 16 years

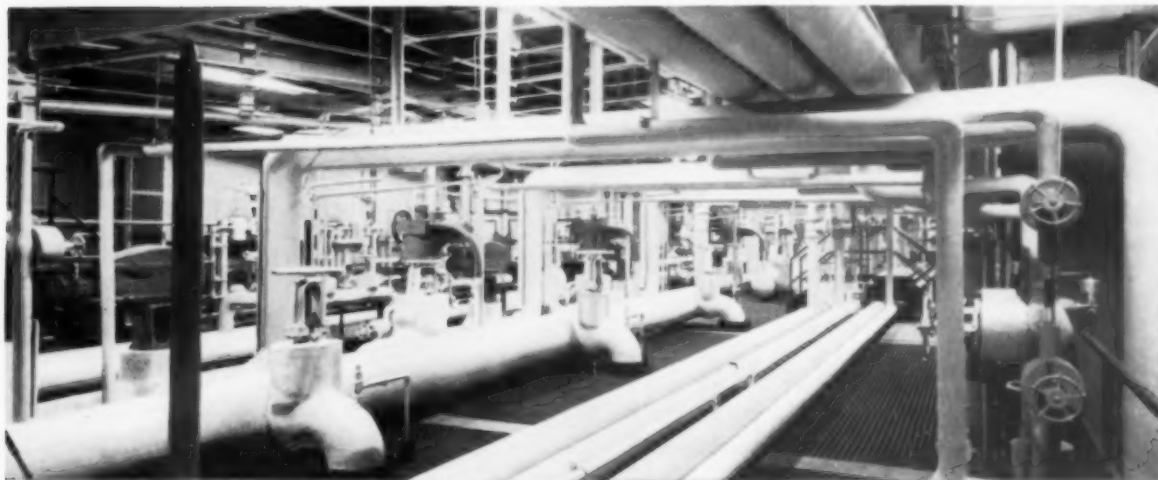
Since 1940, Pennsylvania Power & Light Company has awarded *all* its prefabricated piping work to Grinnell. Some idea of the extent of this confidence in the competence and skill of Grinnell piping specialists can be drawn from the fact that during this 16-year period there were 8 new units installed — with a total capability of close to 800,000 kw's.

Among other companies in the power field which have indicated a marked preference in the past for Grinnell Piping Products are Duke Power, a Grinnell Prefabricated



Sunbury Steam-Electric Station
Shamokin Dam, Pa.

Where some of the 4,500 individual fabricated piping assemblies made by Grinnell were installed at the Sunbury Station.



Piping user for 44 years; New England Electric System, a 6-year, 6-time repeat customer; and Carolina Power & Light, a 7-year, 7-time Grinnell repeat customer.

The big jobs in power piping go to Grinnell because Grinnell's shop facilities offer these practical advantages... superior quality of finished product; faster "on the job" assembly; lower final cost. Assign your next piping job to Grinnell.

Work done by Grinnell for Pennsylvania Power & Light Company

1940-41	Cedar Station, Unit #6
1941-42	Hauto Station, Unit #6
1949	Sunbury Station, Units 1 & 2
1950	Sunbury Station, Unit #3
1953	Sunbury Station, Unit #4
1954	Martins Creek Sta., Unit #1
(Scheduled Completion)	
1956	Martins Creek Sta., Unit #2

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors



pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems



Another POWER MODERNIZATION AWARD
featuring RILEY Steam Generating Equipment.

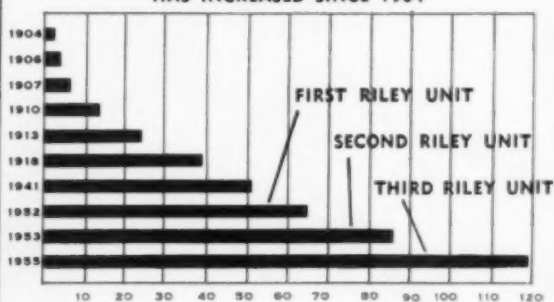
**Iowa-Illinois Gas & Electric Company
employs sound dollar-saving planning
in modernizing its MOLINE STATION**

retires ten old boilers - puts three **RILEY**

Results

1. Increased plant capabilities from 53,000 kw to 119,000 kw.
2. Reduced heat rate 24%.
3. Cut kilowatt production cost by 2 mills.
4. Lowered plant per kilowatt investment from \$131 to \$113.

HOW GENERATING CAPABILITY OF MOLINE STATION
HAS INCREASED SINCE 1904



Generating capability shown in megawatts. No figures are available prior to 1904.

SEVEN RILEY UNITS HAVE BEEN PURCHASED BY IOWA-ILLINOIS GAS & ELECTRIC COMPANY SINCE 1942

Riverside Station, Davenport, Iowa

1942—One 250,000 lbs/hr Unit—975 psi, 825 F
1946—Two 250,000 lbs/hr Units—1000 psi, 900 F

Coralville Plant, Iowa City, Iowa

1948—One 60,000 lbs/hr Unit—500 psi, 730 F

Moline Station, Moline Iowa

1950—One 200,000 lbs/hr Unit—925 psi, 825 F
One 200,000 lbs/hr Unit—825 psi, 900 F
1952—One 250,000 lbs/hr Unit—975 psi, 905 F

Total Steam Generating Capacity—1,460,000 pounds per hour

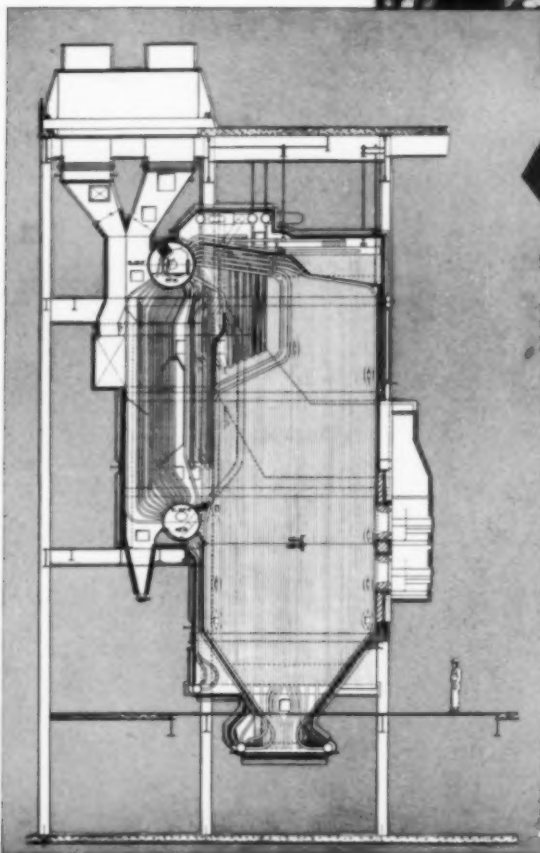
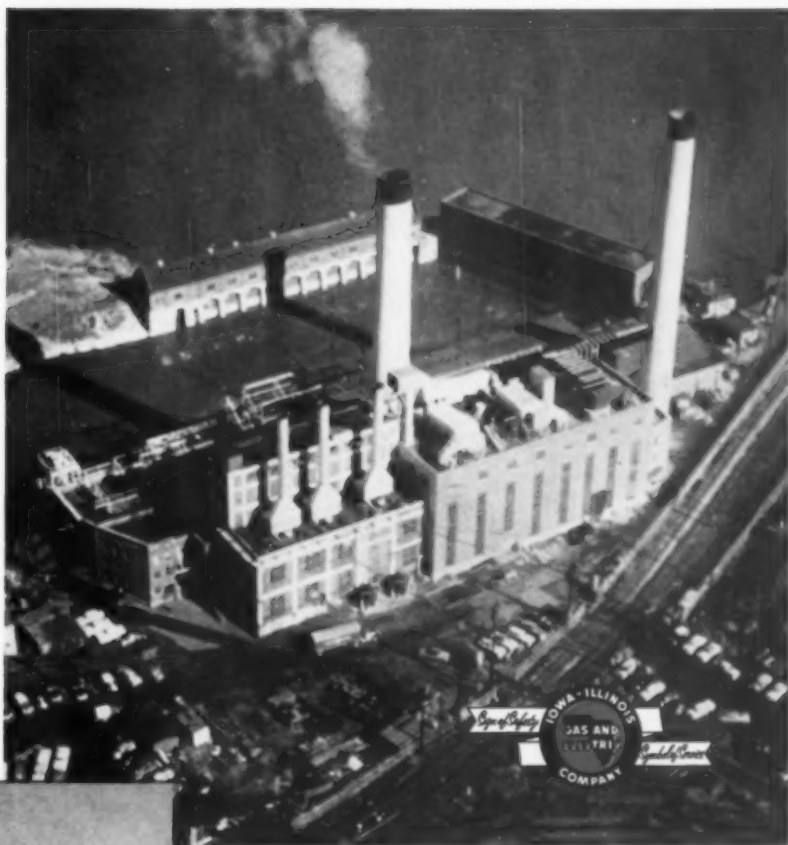
AS a result of a carefully planned two-stage modernization program, Iowa-Illinois Gas & Electric Company's Moline Station now is a modern 119,000 kw generating plant with high operating efficiency. Three Riley Steam Generating Units installed since 1951 have replaced ten old boilers originally installed in 1906. Teaming up with six retained units of the original plant the new Riley units are credited with substantially cutting kilowatt production costs, lowering heat rate and actually reducing the per kilowatt ratio of plant investment.

A further result of this outstanding modernization program was the winning of POWER Magazine's Modernization Award in 1954—a tribute to the sound and realistic economic planning and engineering on the part of Iowa-Illinois Gas and Electric Company and its consulting engineers, Sargent & Lundy.

Moline Station serves the quad-cities of Moline, Rock Island, East Moline, Illinois, and Davenport, Iowa, and supplements the 140,000 kilowatts of the Riverside Station located at Davenport. Riverside Station has three pulverized coal fired Riley units each with a steam generating capacity of 250,000 pounds per hour.

RILEY designs, engineers, manufactures and erects complete steam generating

units on the line



THE third Riley unit installed at Moline Station operates at 250,000 lbs/hr at an efficiency of 88.4% with steam temperature at 905 F and pressure at 825 pounds. Six Riley horizontal flare type forced draft burners are installed for firing oil, natural gas and future coal. The increase in steam temperature from 825 F to 905 F decreased heat rate 2.6%.

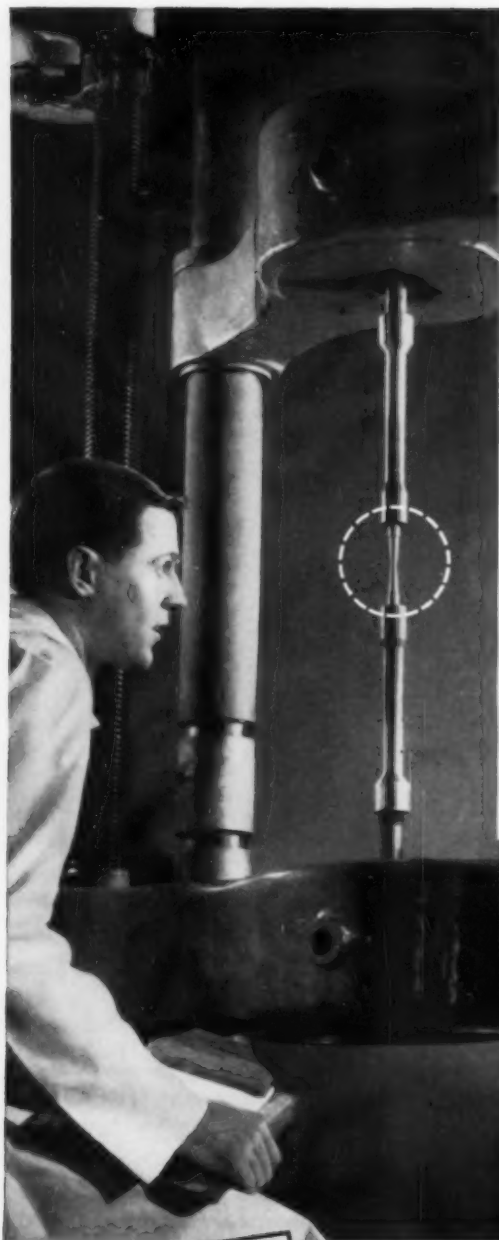


A survey of your plant by a consulting engineer could show ways of making surprising savings in your power costs.

RILEY
Stoker Corporation
WORCESTER, MASSACHUSETTS

Sales Offices: Worcester, New York, Philadelphia, Buffalo, Washington, Pittsburgh, Cleveland, Detroit, Chicago, Cincinnati, Charlotte, New Orleans, Atlanta, St. Louis, Kansas City, St. Paul, Houston, Denver, Salt Lake City, Los Angeles, San Francisco, Portland, Seattle.

units for Public Utility Central Stations and Industrial Power and Heating Plants



How we **S-T-R-E-T-C-H** valve life

Every Powell Valve comes with a long, dependable life built-in. We make certain that every Powell Valve will give long, trouble-free service through careful quality control of every step of manufacture.

Quality control begins with the very materials and metals of which Powell Valves are made. For instance, the tensile strength test—stretching metal to the breaking point—is one of the numerous ways that *Powell Valves have Performance Verified.*

As a final step in manufacture, every Powell Valve is subjected to *an actual line test.* Because of Powell's painstaking quality control, plant shutdown through valve failure is greatly reduced. Records from refineries, power and industrial plants the world over prove it.

Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about our **COMPLETE quality line** which has **PERFORMANCE VERIFIED.**

The Wm. Powell Company

Cincinnati 22, Ohio . . . 110th YEAR



FIG. 11303 WE—1500-Pound
Pressure Seal Steel Gate Valve.

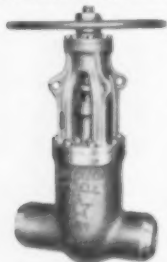


FIG. 3059G—300-Pound Steel
Lubricated Plug Valve. Gear
Operated. Sizes 6" to 12".

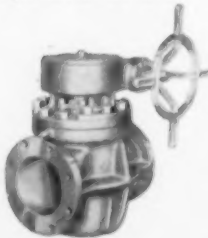


FIG. 19084 WE—900-Pound
Pressure Seal Non-Return Globe
Valve. Gear Operated.



POWELL VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT VALVES.

Continental Engineering & Equipment HELPED SOLVE THIS PROBLEM

Is YOURS Similar?

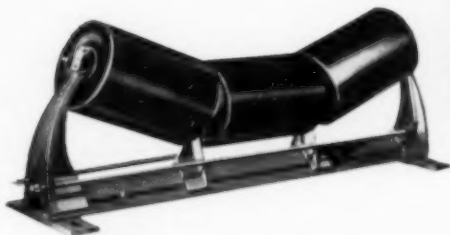
Costly degradation of product plus general inadequate loading facilities required a quick remedy.

This boom conveyor installation designed and engineered in conjunction with the operators and fabricated by Continental resulted in:

1. **MINIMUM** coke **BREAKAGE**
2. **DECREASED** loading **COST**
3. **INCREASED** loading **CAPACITY**

This simple and practical method of loading sized coke or similar friable materials, is another example of how Continental is meeting the material handling problems of all industry.

Let Continental help solve your material handling problems.



Standard Duty Idler

We have the idler for your particular purpose. Write us today for our Catalog ID-481-A, "Continental Belt Conveyors."



Continental Rubber Disc Return Idlers designed for use on belt conveyor handling abrasive or mucky materials decrease idler replacement costs on the above installation.

Specify **CONTINENTAL**

CG-5203

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS



ATLANTA • CLEVELAND • DALLAS • KNOXVILLE



MANUFACTURERS

MEMPHIS • NEW YORK 17, NEW YORK



70 Years Young... and serving 32 states!

From a small start in the coal fields of Southern Illinois in 1886—to distribution in 32 states from coast to coast and from Canada to the Gulf!

That's the story of Bell & Zoller's growth in service to the coal users of America; the result of our reputation and capacity for mining the consistently superior coals of the country's finest coal producing areas

...and of Bell & Zoller's proven ability to deliver these fine coals *at low cost* almost anywhere in America.

Chances are—wherever you are—that Bell & Zoller can supply the best coal for your burning equipment and power producing needs too.

Want proof? Phone your nearest Bell & Zoller office.

- Alabama
- Arkansas
- California
- Connecticut
- Delaware
- District of Columbia
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Nebraska
- New Hampshire
- New Jersey
- New York
- North Carolina
- Ohio
- Pennsylvania
- Rhode Island
- South Dakota
- Tennessee
- Utah
- Vermont
- Virginia
- West Virginia
- Wisconsin

Bell & Zoller Coal Company

BELL BUILDING, CHICAGO 1, ILLINOIS

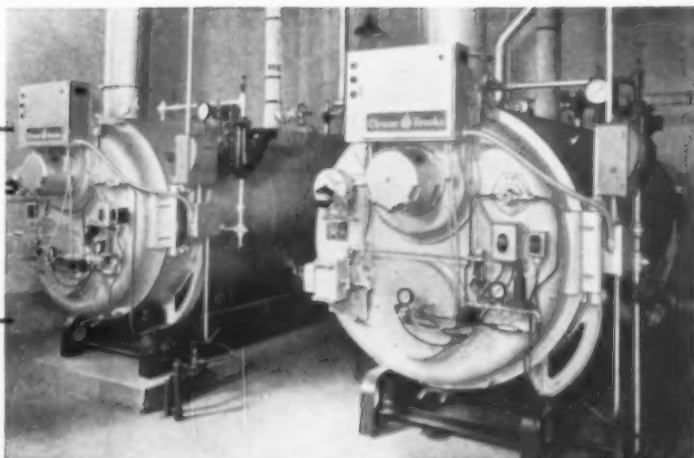
Cleveland • New York • St. Louis • Minneapolis
Omaha • Milwaukee • Louisville • Washington, D.C.
Terre Haute, Ind. • Mount Hope, W. Va.



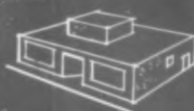
—18 sizes

—110 models

15 to 600 hp

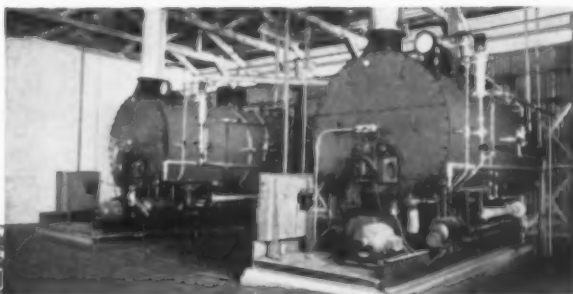
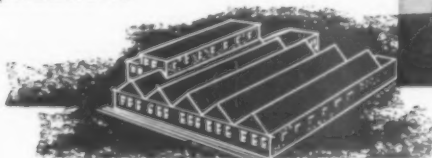


CB SERIES — The ultimate in compact, quiet-running boilers. Sizes: 15 to 150 hp.



yours from Cleaver-Brooks

the broadest line of
cost-saving "packaged"
boilers — for hundreds of
applications



LR SERIES — Standard of the industry for hot water or steam service, for heating or processing. Sizes: 200 to 600 hp.

THE two installations above are representative of Cleaver-Brooks' broad range of standard models. The wide choice makes planning and selection of a boiler for your specific needs — large or small — a simple, time-saving procedure.

Your nearby Cleaver-Brooks representative, with years of specialized boiler experience, can be of real service to you. Working with you and your engineers, he can help you to find ready answers to questions of size, loads, present and future steam or hot water needs, space and equipment arrangement. Where local conditions dictate, oil, gas or combination oil/gas firing can be selected for greatest savings. And once installation is com-

pleted, arrangements are made for factory-supervised starting and training your operator.

Keep in mind, too, the many fuel and maintenance-saving advantages of four-pass design with forced draft . . . the standard equipment electronic combustion controls which assure continuous, safe operation.

Cleaver-Brooks boiler owners enjoy all these advantages and share in the combined application engineering experience of more than 19,000 individual boiler installations. Put this experience to work for you. Cleaver-Brooks Company, Dept. C, 304 E. Keefe Ave., Milwaukee 12, Wis., U.S.A., Cable Address: CEEBEEWEST — all codes.

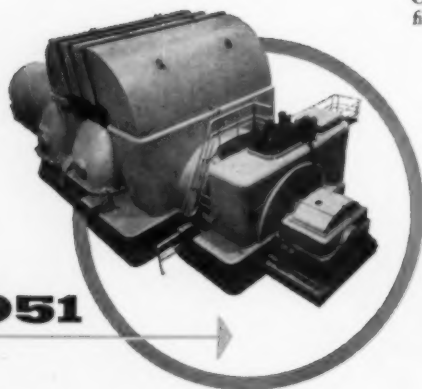


See the classified pages of your phone directory for name of nearest representative. Send us your name to receive regular issues of the new Cleaver-Brooks Bulletin, or write for newest literature.

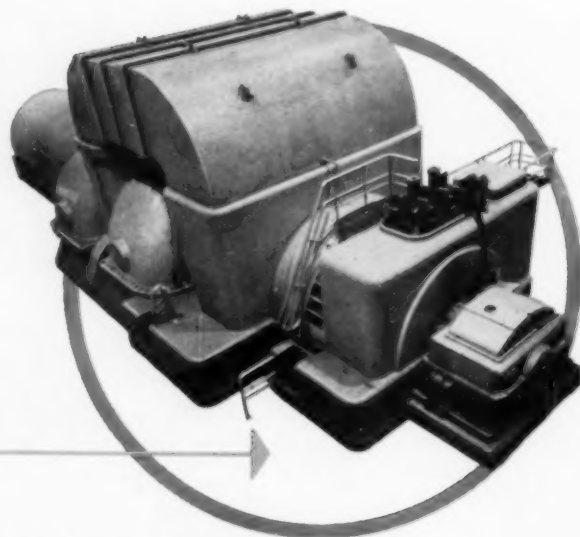
Cleaver-Brooks®

— TWENTY-FIVE YEARS OF LEADERSHIP
BY THE ORIGINATORS OF THE SELF-CONTAINED BOILER

Units No. 1 and No. 2 are 150,000 KW General Electric cross compound turbine generators. Unit No. 1 was installed in 1951, and unit No. 2 in 1953, at the Indiana and Michigan Electric Company's Tanners Creek Plant, Lawrenceburg, Indiana. Both lubricating systems were filled with 6500 gallons of Gulfcrest.



...in **1951**



...in **1953**

and again in **1955**

the Indiana and Michigan Electric Company selected

GULFCREST OIL

to provide long range turbine protection

Gulfcrest has an unmatched record of outstanding performance in every make and type of steam turbo-generator. There are two good reasons for its recognition as the world's finest turbine oil.

First, crudes are carefully selected for the best turbine oil properties, then put through the usual refinery steps for oils of this type. Next, the oil is Alchlor Processed—Gulf's exclusive super-refining step which removes the unstable hydrocarbons that form sludge, harmful acids, and accelerate oxidation. Special inhibitors are also added to increase oxidation stability, prevent foam and protect against corrosion.

In several large turbines Gulfcrest has been

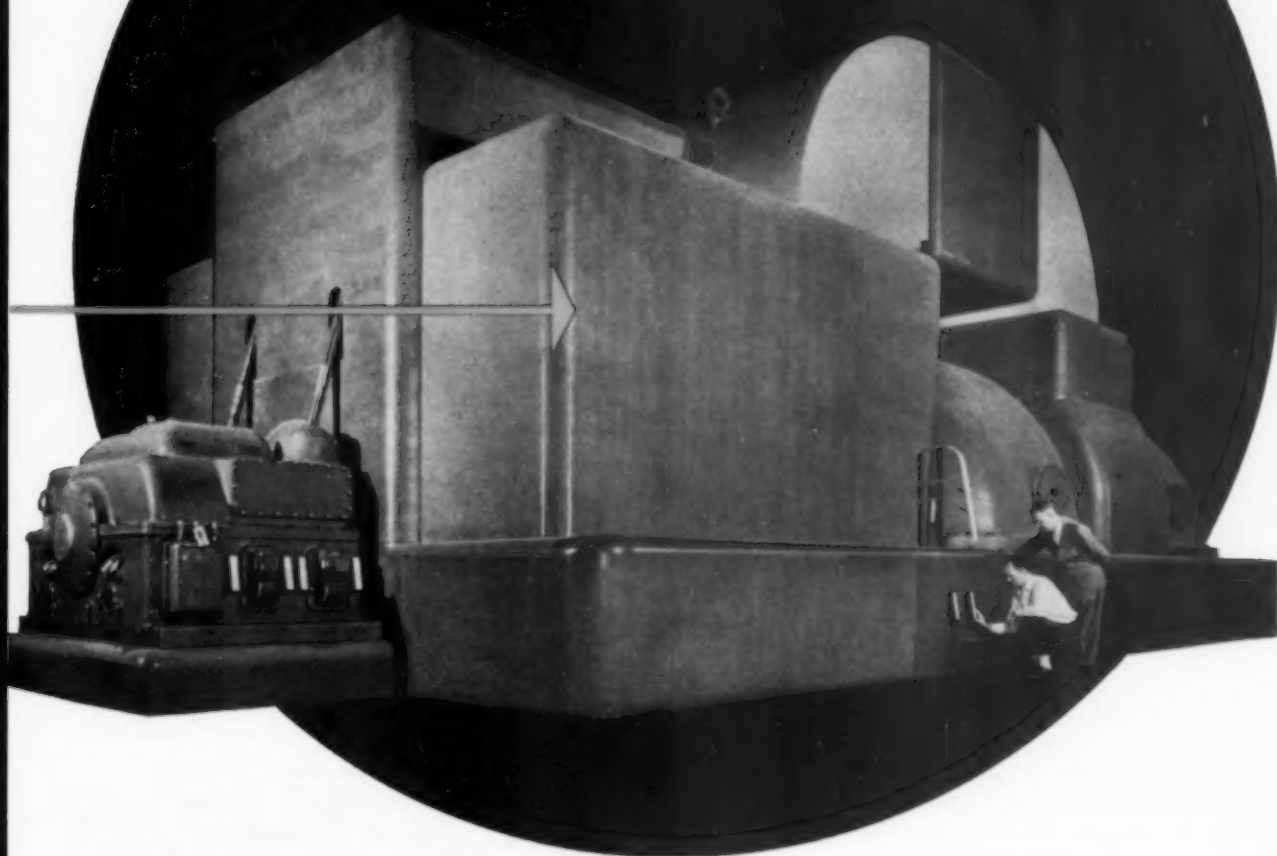
in continuous service for over twenty years. The systems are still free from sludge or rust, and neutralization numbers of the oil remain remarkably low.

The next time you fill a turbine system specify Gulfcrest—and insure safe, long-lasting protection. Consult the telephone directory for the number of your nearest Gulf office and have a Gulf Sales Engineer recommend the right grade of this outstanding oil for your turbines.

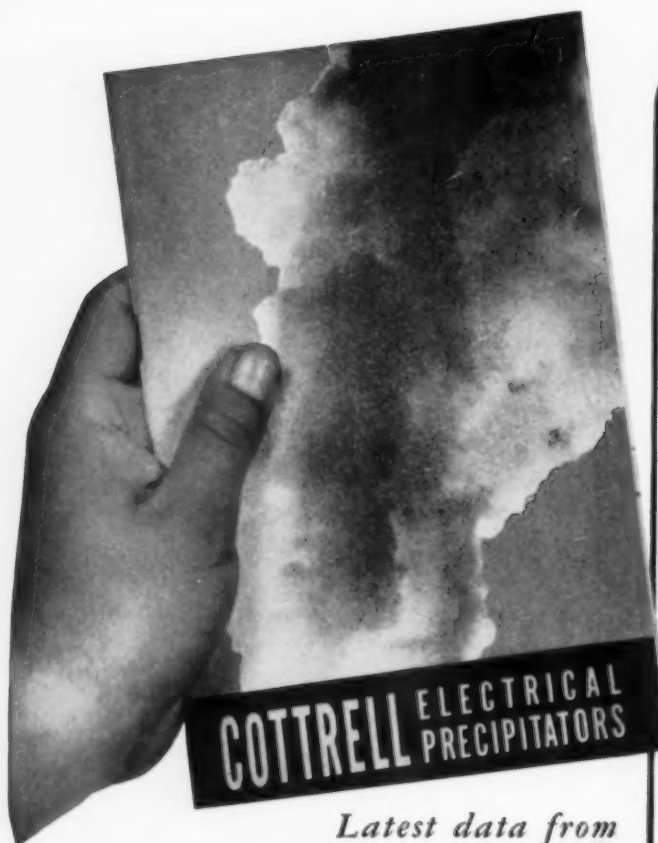
Gulf Oil Corporation • Gulf Refining Company

1822 GULF BUILDING, PITTSBURGH 30, PA.

When the huge No. 3 unit,
a 215,000 KW General Electric Turbine,
went into operation during 1955 at the
Tanners Creek Plant, it too was filled
with GULFCREST.



THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS



*Latest data from
Western Precipitation
on Cottrell Recovery Equipment*

Do you have operations in your plant where gas-laden suspensions, wet or dry, are a problem? Such suspensions may be dropping on surrounding property, causing nuisance difficulties.

Or perhaps important values are being lost in stack gases that can be profitably recovered.

Whatever the nature of your recovery requirements, you will find this 40-page Cottrell booklet of great help. It contains up-to-date data on the latest advancements in the electrical precipitation field - prepared by the organization that pioneered the commercial application of Cottrell Electrical Precipitators almost a half century ago and has consistently led in new Cottrell developments.

A copy of this data-packed booklet will be sent free to engineers and other executives interested in recovery processes. Send your request to our nearest office.

For nearly 50 years Western Precipitation has carried on a continuous research and development program on Cottrell Electrical Precipitators, Multiclone Mechanical Collectors and other types of recovery equipment. We are not affiliated with any other company in the electrical precipitation field except our wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. We are equipped to serve you anywhere in the United States, Canada, and throughout the world!

40 PAGES of helpful information

on Recovering Dusts, Fly Ash,
Mists, Fumes and other Sus-
pensions from Gases.

This booklet summarizes

the important points design and plant engineers
should know about Cottrell Precipitators . . .



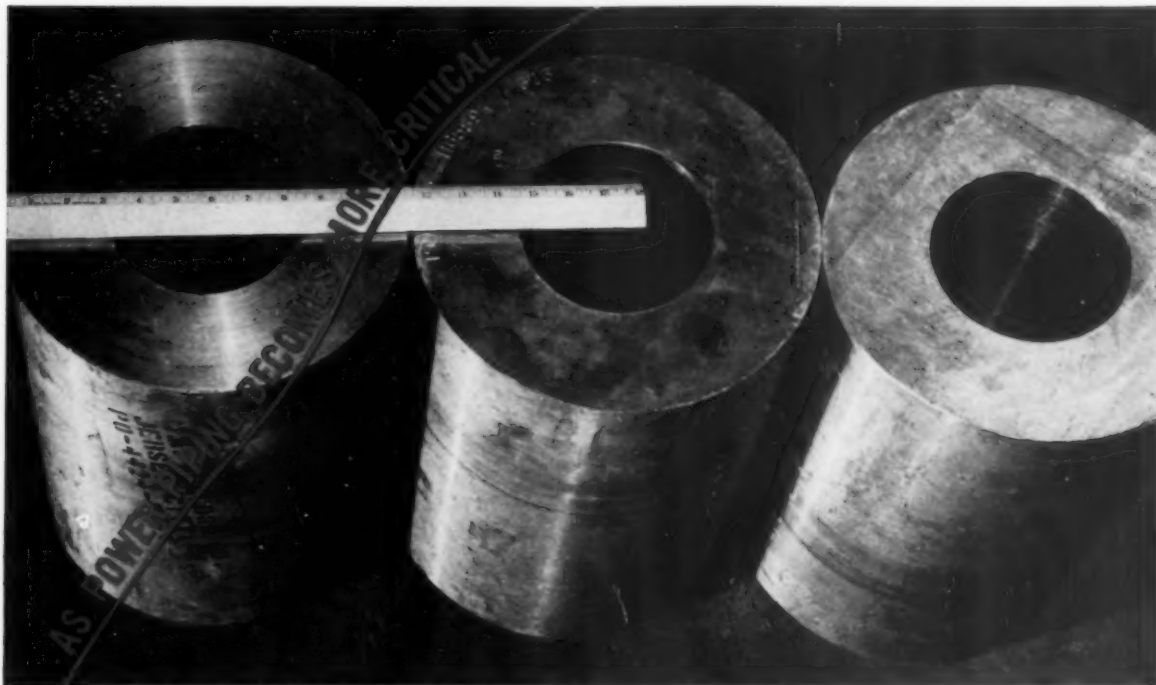
- Basic types of Cottrell equipment.
- Principal elements in a Cottrell unit.
- Data on Mechanical and Electronic Rectifiers.
- Various types of Collecting Electrodes (rod curtains, corrugated plates, pocket electrodes, etc.).
- Typical ways of removing collected material.
- Various Shell Constructions (steel, concrete, brick, etc.).
- The effect of various factors on efficiency and performance.
- Data on CMP (Combination Multiclone-Precipitator) Units.

. . . and many other helpful facts on Cottrell design and operation.

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR
COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUORS

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HOBART BUILDING, SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL



Heavy-walled sections of new and existing alloys, most never before used for the purpose, are tested and evaluated by Kellogg toward improving design and performance of main and reheat steam piping.

M. W. KELLOGG METALLURGY KEEPS PACE

With wall thicknesses of main and reheat steam piping for current steam-electric power plants already approaching the upper limits of practicality, supercritical pressures and temperatures present a multiplicity of metallurgical problems to the power piping designer and fabricator. New and stronger stable alloys must be developed, new welding materials found, and new welding techniques and heat treating procedures perfected.

At The M. W. Kellogg Company, new materials containing alloying elements such as molybdenum, cobalt, tungsten, nitrogen, and titanium—in addition to chromium, nickel, and columbium—are now being investigated for long term high pressure service to 1300 deg. F. Most have never before been used for main or reheat steam piping. Heavy-walled sections of these materials are welded, tested, and evaluated by every known technique at Kellogg's Jersey City metallurgical laboratories.

The results of these continuing studies will prove extremely valuable to consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment.



Sections of piping are welded, using various materials and techniques, and then tested for strength and other characteristics.

FABRICATED PRODUCTS DIVISION

THE M. W. KELLOGG COMPANY, 225 BROADWAY, NEW YORK 7, N.Y.

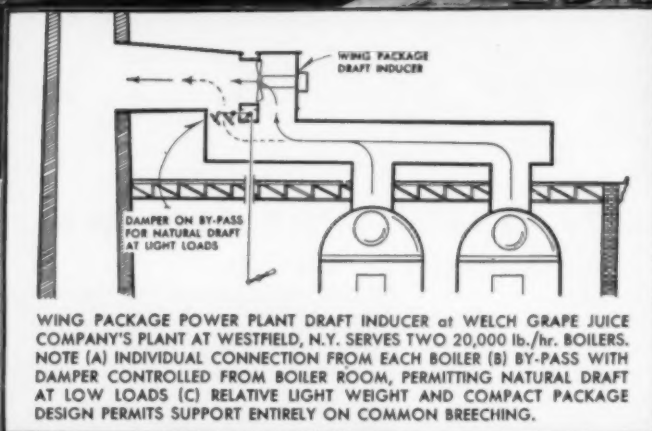
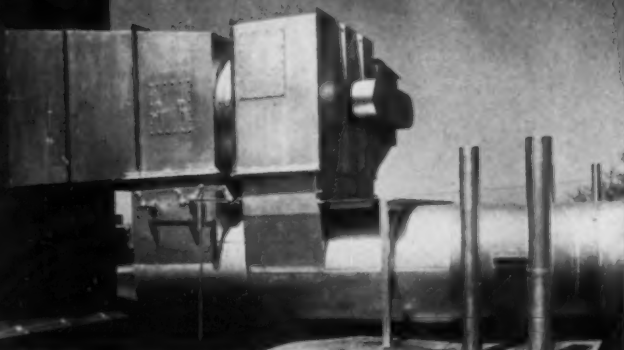
The Canadian Kellogg Company, Ltd., Toronto • Kellogg International Corp., London

SUBSIDIARIES OF PULLMAN INCORPORATED



POWER PIPING—THE VITAL LINK

The WING Package DRAFT INDUCER



The WING Package DRAFT INDUCER is unique in that the motor (or turbine) and fan is designed as one complete removable unit, making installation easier and being easily removed, facilitates inspection and maintenance. Other advantages are:

1. Big savings in space requirements
2. Permits fewer and lighter structural supports
3. Eliminates field line-up problems
4. Eliminates water cooling
5. Only two support bearings
6. Wide flexibility in gas outlets
7. Saves on investment and maintenance
8. Low load ratings on natural draft because of ample free gas travel area

Wing

Write for complete details
L. J. Wing Mfg. Co.
169 Vreeland Mills Road
Linden, New Jersey



Expansion Briefs

Union Electric Expanding Meramac Station — Missouri

H. B. Wallace, Jr., Manager of Steam Sales, Foster Wheeler Corporation, recently announced that Foster Wheeler has received an order from **Union Electric Company of Missouri**, St. Louis, Missouri, covering a dual circulation reheat steam generator for Unit No. 3 at the Meramac Plant.

The steam generator will have a maximum continuous capacity of 1,850,000 lb/hr at 2150 psi and 1010 F with reheat to 1010 F. Fuels will be bituminous coal pulverized in three Foster Wheeler ball mills and natural gas. The equipment is scheduled for operation the latter half of 1958 and will add 250,000 kw to the Union Electric system.

Holan Thrift Line Georgia Plant in Full Production

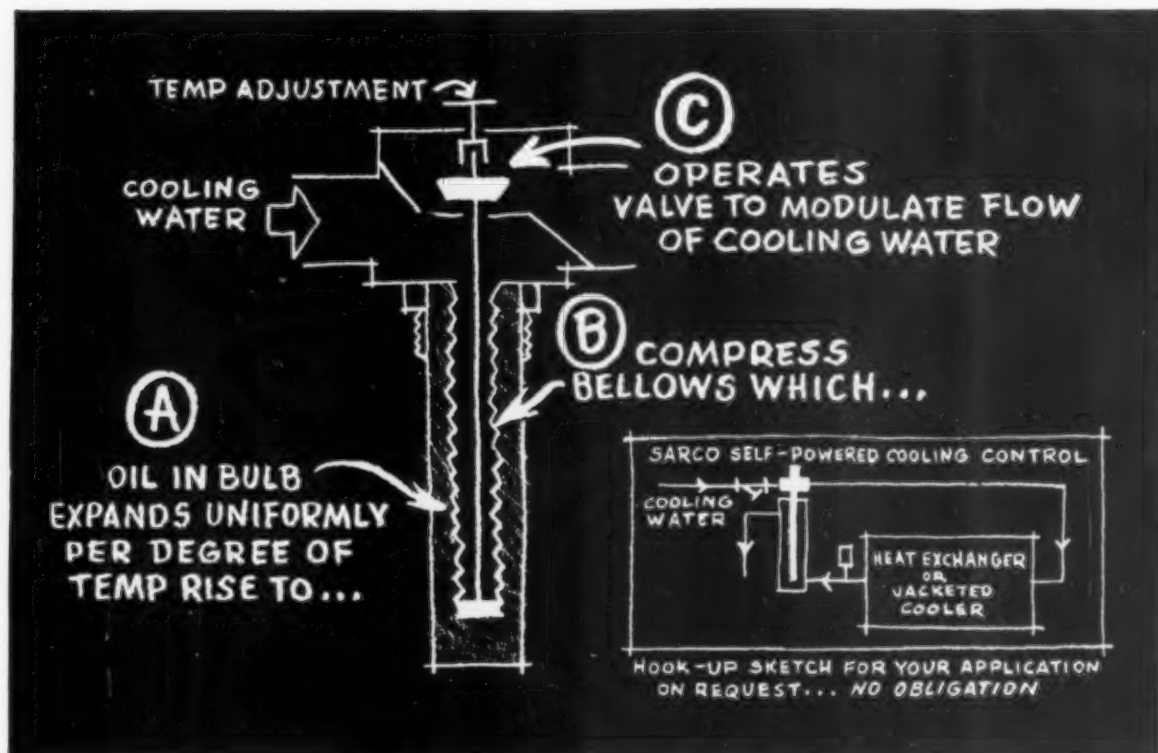
To better serve Southern industry, the J. H. Holan Corporation of Cleveland, Ohio, recently built a modern manufacturing plant — **The Holan Thrift Line Corporation** — in **Griffin, Georgia**.

Now in full production, Thrift Line manufactures bodies and equipment including a new line of power-operated construction tools. **Mr. George Eckles** is Vice-President and General Manager and **Mr. Arthur C. Frank**, Sales Manager.

To save labor and improve field construction and maintenance, Thrift Line has a brand new line of mechanical and hydraulic earth borers which cover a wide range of digging conditions. Aerial ladders are offered in both mechanical and full hydraulic powered types in various heights for any type of overhead work or maintenance.

Hydraulic towers and fully maneuverable aerial elbow units with finger tip control for easy access to overhead jobs are assembled on Holan bodies in the new Griffin plant.

For utility construction and maintenance trucks, a wide range of hydraulic derricks are made in capacities up to 12,000 lb safe load. These units are efficient and sturdy offering long service with minimum maintenance and upkeep.



Simple, inexpensive way to end waste and hazards of overcooling

WHEN cooling water is manually controlled ...the operator is forced to play it safe by leaving the water valve wide open to compensate for variables in the load and water pressure and temperature. Result—*overcooling*. If he tries to vary the flow of water...he risks *undercooling*.

It pays to take responsibility off the operator's shoulders. Optimum *safe* temperature can be automatically assured by using Sarco Cooling Controls. They eliminate both overcooling and undercooling. They replace guesswork with certainty. Save man-hours and cooling water. Prevent damage to equipment.

Simple and Trouble-Free

Simple, trouble-free design—as you can see above, a temperature control need not be complicated! Self-powered...no electricity or compressed air required. Self-contained...no exposed mechanism. Packless...no packing to wear or leak.

Each year, thousands of these fully modulating and sensitive Sarco Controls provide dependable

service for firms such as Ingersoll-Rand, Butler Manufacturing Co., and Swift & Co.

Low Price

The low price makes it possible for you to use Sarco AUTOMATIC temperature controls for ALL control jobs, not just the big ones! For example, the $\frac{3}{4}$ " size costs only about \$39! Mail the coupon now.

SARCO

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

Please send information on your simple, inexpensive Self-Powered Cooling Controls for use on _____

Name _____

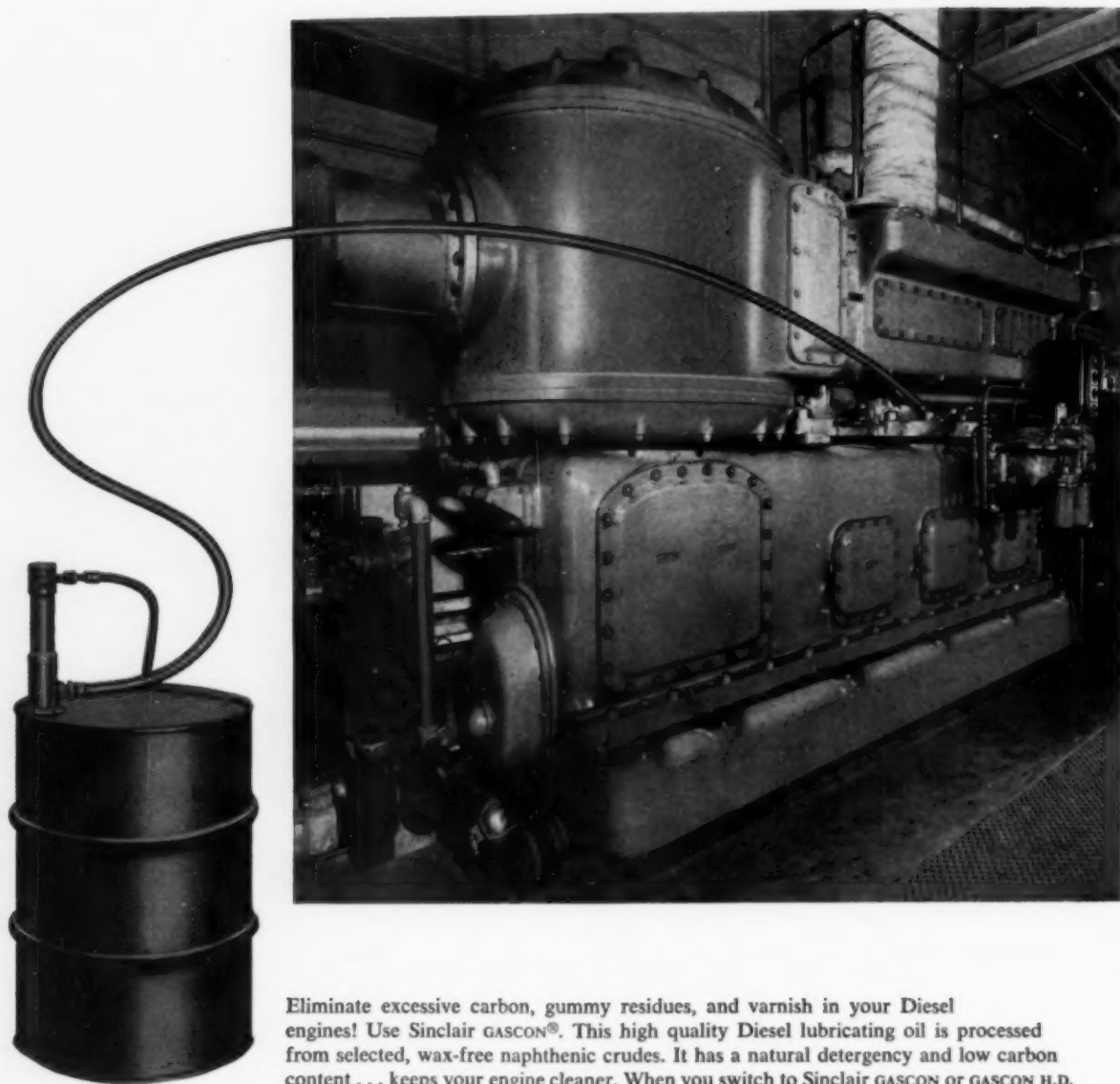
Firm _____

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City _____ State _____

2188-B

Check Carbon!



Eliminate excessive carbon, gummy residues, and varnish in your Diesel engines! Use Sinclair GASCON®. This high quality Diesel lubricating oil is processed from selected, wax-free naphthenic crudes. It has a natural detergency and low carbon content . . . keeps your engine cleaner. When you switch to Sinclair GASCON or GASCON H.D. you know that pistons, rings, valves and exhaust ports stay free from carbon, gums and varnish.

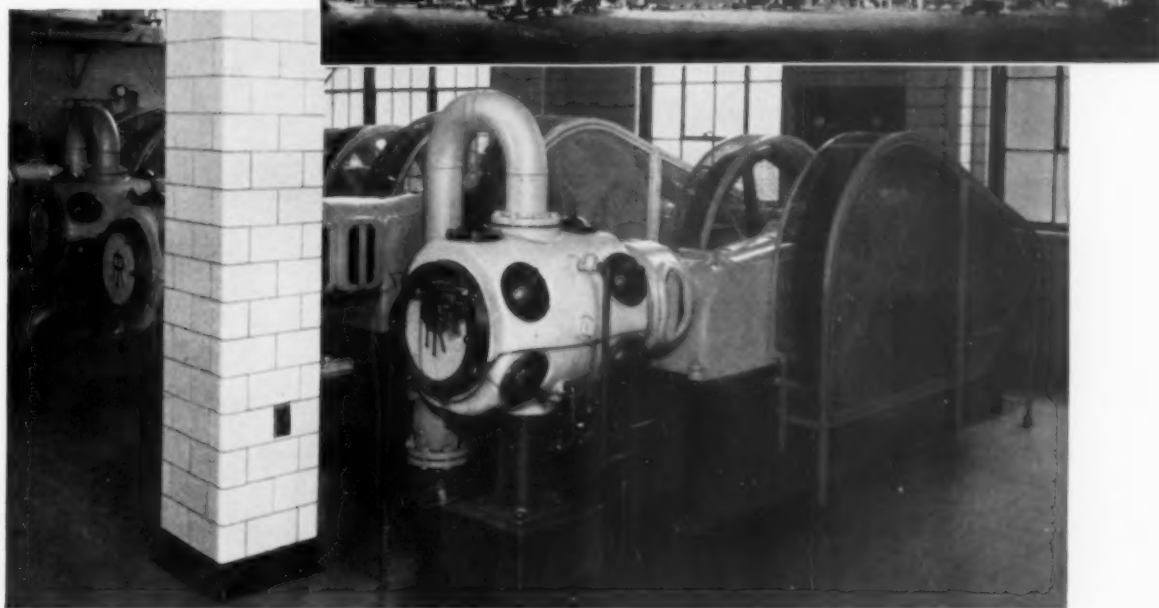
No matter what design of engine you're operating, you'll be 'way ahead with Sinclair's complete line of Diesel lubricants. Contact your local Sinclair Representative now for full details, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR GASCON OILS

20 years of clean OIL-FREE air

at *Schaefer*

**Brooklyn
Brewery**



Ingersoll-Rand Class ES Compressors with NL (non-lubricated) cylinders provide all plant and process air at one of America's largest and finest breweries

It takes a lot of air to operate a big, modern brewery — air for instrumentation, weighing, conveying, bottle capping, plant maintenance and movement of beer in preliminary processing. And any air that comes in contact with the beer or its ingredients must be *absolutely free of oil*.

The non-lubricated compressor was pioneered and developed by Ingersoll-Rand Company and it was here at Schaefer's, more than 20 years ago, that one of the first of such units was installed. Self-lubricated dry carbon rings eliminate the need for any oil in the cylinder or packing, keeping the air entirely free from contamination. Three more ES compressors with NL cylinders were installed

later, and now all four of them are in daily service, as shown in the photo above at the Brooklyn plant of America's oldest lager brewers.

Wherever oil-free compressed air is needed, it pays to specify Ingersoll-Rand NL cylinders. Write or phone for complete details.



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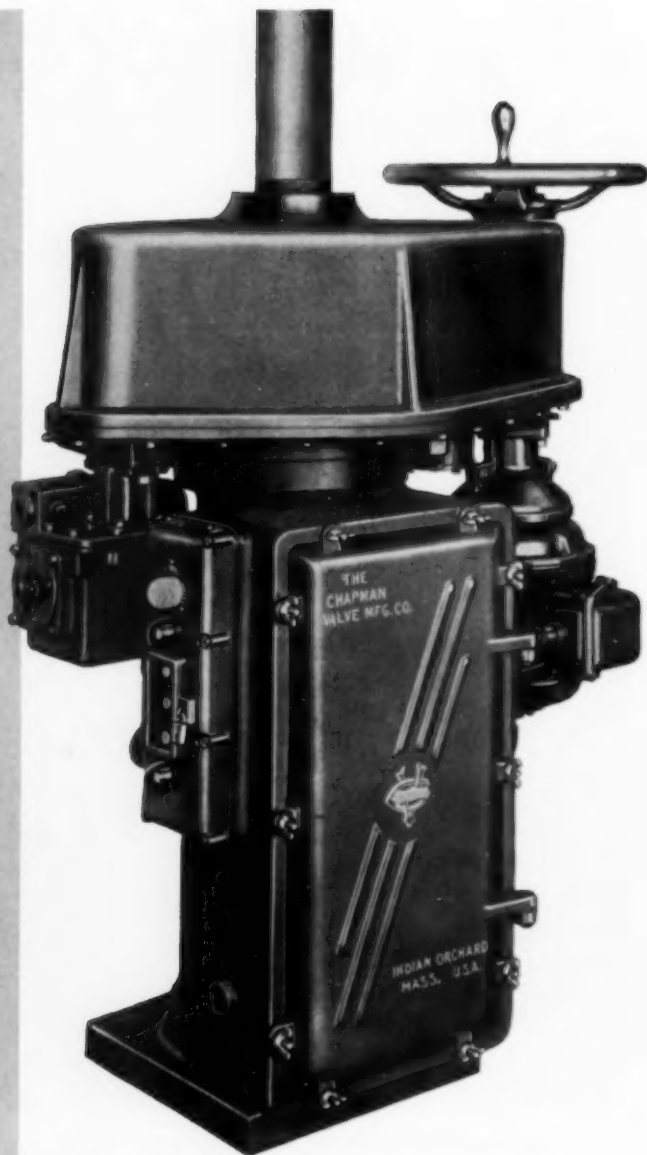
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SOUTHERN POWER & INDUSTRY for MARCH, 1956

**Fewer Parts
Mean
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Floorstand Motor Unit . . . control panel, motor, limit switch and push button station.



Simple, durable mechanism of Chapman's Motor Unit. Handwheel remains stationary during motor operation.

IN CHAPMAN MOTOR UNITS

Chapman's simple and rugged Motor Unit gives accurate, trouble-free control of large valves and sluice gates. It has approximately *half as many parts* as any other unit. Its simplified design, low speed motors and low-ratio, stubtooth gears combine to give positive operation without drift, in any position and under all conditions.

Installation is fast and simple. The floorstand unit comes completely wired, ready to connect to leads. Limit switch has micrometer adjustment for exact pre-setting for seating tightness. Motor Units operate smoothly under the most adverse conditions. All units are weather-proof and steam-tight. Write today for *new* Catalog 51.

The Chapman Valve Manufacturing Co.

INDIAN ORCHARD, MASSACHUSETTS

TIMELY COMMENTS

SOUTHERN POWER
AND INDUSTRY

Automation — What's Ahead? (Summary of ASTE Survey Findings)

THE AMERICAN Society of Tool Engineers, 33,000-member technical society of production executives and engineers, has just completed a broad-scale study of "what's ahead in automation." Covering the nation's major metalworking industries — in plants of all sizes — in every geographical region of the United States — it has come up with many findings, some of them quite surprising. Here are a few of them:

As far as industry can see today, automation eventually can be applied to about 16% of all manufacturing operations in the metalworking industries.

The percentage, while small, would open enormous potential markets for all kinds of equipment since a majority of conversions to automation would require complete replacing of present processes and equipment.

Approximately 18% of all 1956 production equipment orders by the metalworking industries covered in the study will call for automation; for 1956-57 the total will be close to 22% of all equipment orders.

Automation is less adaptable to the really big plants than to the medium-sized plants. It is easier to automate manufacture of an engine, a transmission, or an axle, than to automate production of a complete automobile.

If automation should take hold on a broader scale, the "big-plant" concept as being the most efficient would be discarded. The medium sized plant would get the nod.

Automation is entirely feasible in many small plants in which production is relatively continuous on one or two products.

While industry in the Middle Atlantic states and East North Central states shows an expected high interest in automation, interest in the South is at an equally high level.

Automation is of top interest to producers of "fabricated metal products" in general (pots and pans, toys, pipe fittings, sporting goods, etc.).

The biggest market for automation equipment is among these "fabricated metal products" manufacturers. Automated equipment will represent 20-25% of the industry's 1956-57 total equipment orders.

The automotive industry is still way out in front among current markets for automated equipment. Over ¾th of its 1956, over 1/3rd of its 1956-57 equipment purchases will be automated.

The study, long planned by the technical society in preparing for its giant 1956 Industrial Exposition which will open in Chicago on March 19th — the largest in the society's history — has also revealed that emphasis on automation will

produce major influences on the design of future products. According to ASTE officials, the survey shows that there will be a greater tendency toward standardization of components, even though there may be less standardization of assemblies. Other findings in this direction include:

Product design will take available production equipment much more into account than formerly, to avoid obsoleting of costly automated equipment.

A new concept of "standards" will come in with automation. Rather than having fixed values, "standards" as applied to automated processes and equipment would have a **range** of values to permit reasonable future product variations without obsoleting of automation equipment. Standards must have 'versatility' and 'flexibility.'

As yet there is no major expectation that automation can be applied profitably to job shops or job-lot runs. If equipment can be developed which will permit profitable automation of short runs, industry would welcome this.

While the ASTE study showed that only 16% of current manufacturing operations in the U. S. can be automated profitably, an enormous market for new equipment is represented by that 16%. To become 16% automated, industry would have to replace, first of all, the following items of equipment now in use (conservatively estimated):

1. Over 200,000 machine tools
2. Over 55,000 grinders and finishers
3. Close to 50,000 metal forming machines
4. Approximately 25,000 production welders

... plus related amounts of other types of production equipment.

As viewed by the metalworking industries, the balance of the 16% would be obtained by automating existing equipment instead of replacing it. This conversion adds further to the market for loading and unloading devices, control equipment, etc., to cover the following approximate numbers of items of equipment:

1. 125,000 machine tools
2. 25,000 grinders and finishers
3. 40,000 metal forming machines
4. 12,000 production welders

... plus proportionate amounts of other equipment.

(For more on Automation—turn page)



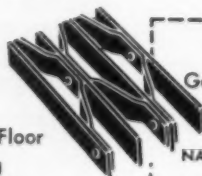
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INDUSTRY SPEAKS



R. P. CROCKETT

What Automation Can Do for Your Company

General Electric's new film on **AUTOMATION** was shown before foremen, supervisors and department heads of **Atlantic Steel Company** in Atlanta, Jan. 19. The following introduction to the film was presented by GE's Sales Engineer **R. P. CROCKETT**.

AUTOMATION has been pictured by some people as a fearful and revolutionary thing, others consider it a normal and evolutionary development in manufacturing progress. Some have pictured Automation solely in terms of giant computers, others in terms of materials handling systems.

Considering all this, it may seem presumptuous of us in the General Electric Company to offer you a program which defines Automation and illustrates the application of Automation principles throughout industry. We do not think it is too difficult.

Our definition of Automation is simple. It is this: Automation is a way of manufacturing based on *continuous automatic production*. This would include automatic handling, and automatic making, inspecting, assembling, testing, and packaging of parts and products in one continuous flow.

But few of us, if any, are even close to continuous automatic production, except perhaps on a very limited scale. If we were to group manufacturing operations into three broad areas — the *Manual Area*, the *Mechanization Area*

(which is typified by today's electrified mass production) and the *Automation Area*, we would find that manual operations are remarkably common today — even outside the tool room. On the production lines of our most mechanized plants, people still put things together by hand. And they measure, finish, sort, lift, and move the parts or products in process by hand.

Analysis of the manufacturing operations in all of our businesses would reveal, I think, that the average for all manufacturing operations falls in the lower part of the Mechanization Area.

This means that we are losing money on manual operations that constitute as much as 50% of the cost of many products. It means that we are losing money in excessive inventories. It means that we are losing money by over-investment in costly factory space instead of in more productive machinery.

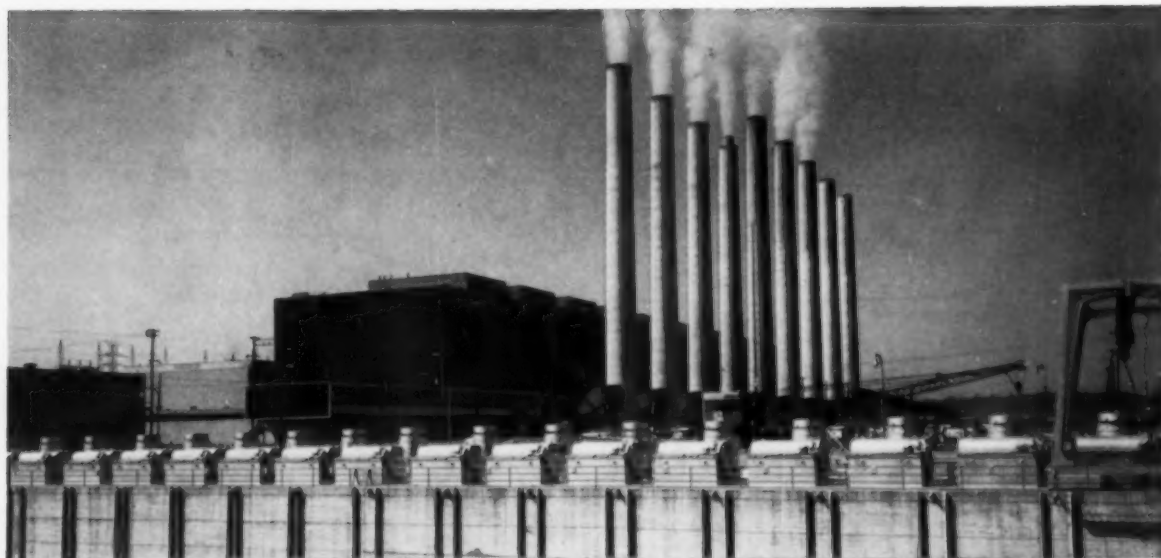
You do not need to be told that labor is getting scarcer and costlier and that the cost of materials is rising. Considering all these things —and considering the fact that

competition is getting keener as new competitors appear and as old ones increase their efficiency — how can you remain competitive in today's and in tomorrow's markets? The answer is, by improving your operations, step-by-step, towards continuous automatic production.

Automation is an *evolutionary* concept and not a Second Industrial Revolution. It has been developing since the early 19th century.

If there is anything really new about automation — and there is — I would say it is the fast pace of acceptance. Today the principles of Automation are being *systematically* applied by more and more businesses to the solution of their manufacturing problems.

The automation film presented by General Electric contains many suggestive illustrations of automation and much helpful information on the factors to consider as you draw up your plans for automation. Information on availability of the film and an illustrated booklet on Automation will be provided by any area General Electric Apparatus sales office.



Nine Units Total 1,600,000 KW

BOILERS—1,280,000 pounds per hour at 1840 psig, 1053F, and 88.46% efficiency

TURBO-GENERATORS—200,000 kw maximum rating. Reheat to 347 psig and 1050 F. Turbine heat rate 7777 Btu

By **GEORGE E. TOLES**

THE WORLD'S LARGEST steam-electric plant has been completed near Kingston, Tennessee by the Tennessee Valley Authority.

With the final unit going into operation, the entire plant has reached a capacity of 1,600,000 kilowatts. This is more than 15 times the capacity of Norris Dam.

Construction of the huge plant was begun in April, 1951 to provide additional firm power in the East Tennessee area. The site lies at the base of the peninsula formed by embankments of the Watts Bar Reservoir on the Clinch and Emory Rivers, being about 2.7 miles above the confluence of the two rivers. The plant is four miles from Kingston.

A decided asset is the fact that cooling water for the condensers is obtained from the Emory River and, after passing through the condensers, is discharged into the Clinch River, the point of discharge being approximately 4½ miles from the intake.

A railroad connection with the Tennessee Central Railway at South Harriman has been made

by the construction of an access railroad about 4½ miles long, which with the various sidings and yards contains about 31 miles of track. A rail connection has also been made with the Southern Railway at Emory Gap. The site is also readily accessible by water.

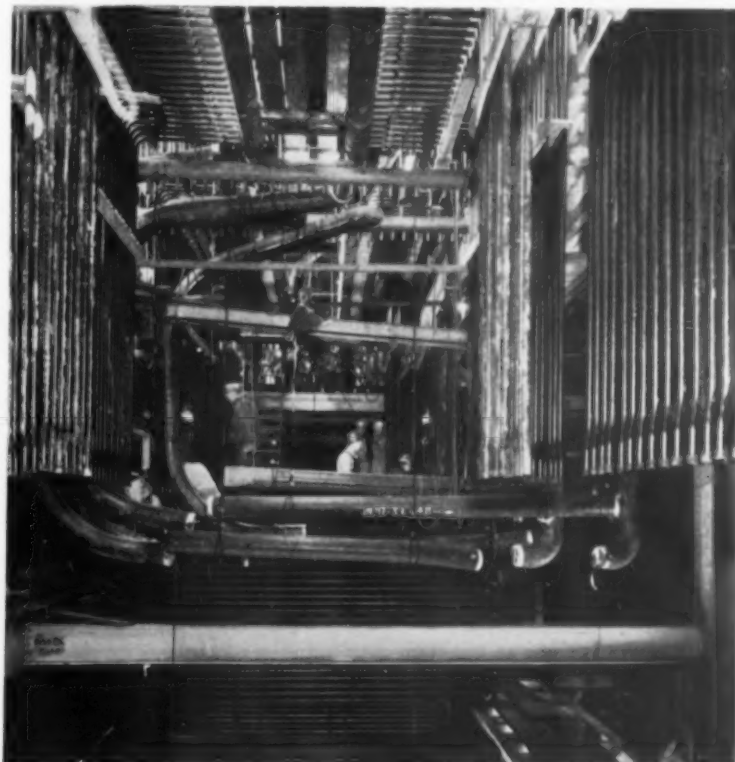
There are ample reserves of coal

in the vicinity and a plentiful supply of cooling water for condenser circulating purposes.

The initial appropriation of funds by Congress provided for four 150,000 kilowatt capability generating units. Subsequent appropriations provided for five additional units each of 200,000 kilowatt capability.

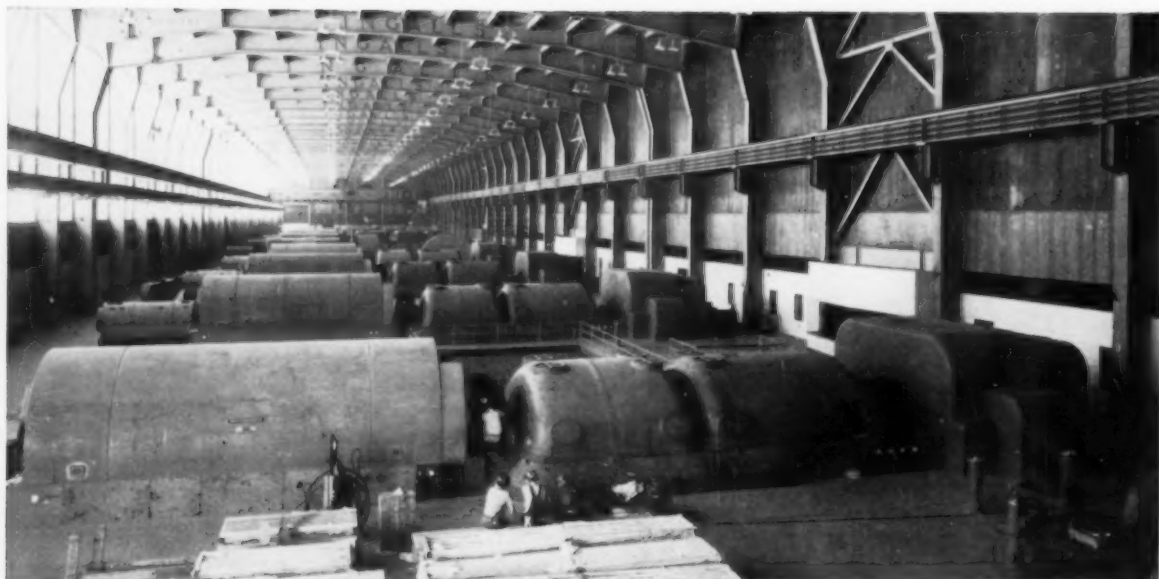
The main building of the nine unit plant consists of a generator room 895 ft long and 115 ft wide, a boiler room 865 by 141 ft, and a shop and office area 210 by 212

Boiler superheat section for unit 5



PLANT EXTERIOR

- (1) Intake Structure
- (2) Stacks and Boiler Room
- (3) Transformers and Turbine Room



View of turbine room with 150,000 kw units in foreground

ft. The boiler room portion has a height of about 111 ft above the ground level with the basement foundation extending 40 ft below. Four of the nine outside stacks project 250 ft above ground and the other five 300 ft.

The 150,000 kilowatt turbo-generators operate at 3,600 rpm and 18,000 volts with steam pressure of 1,800 psi at 1,000 F. The 200,000 kilowatt units operate at

3,600 rpm and 2,000 volts with steam pressure of 1,800 psi at 1,050 F.

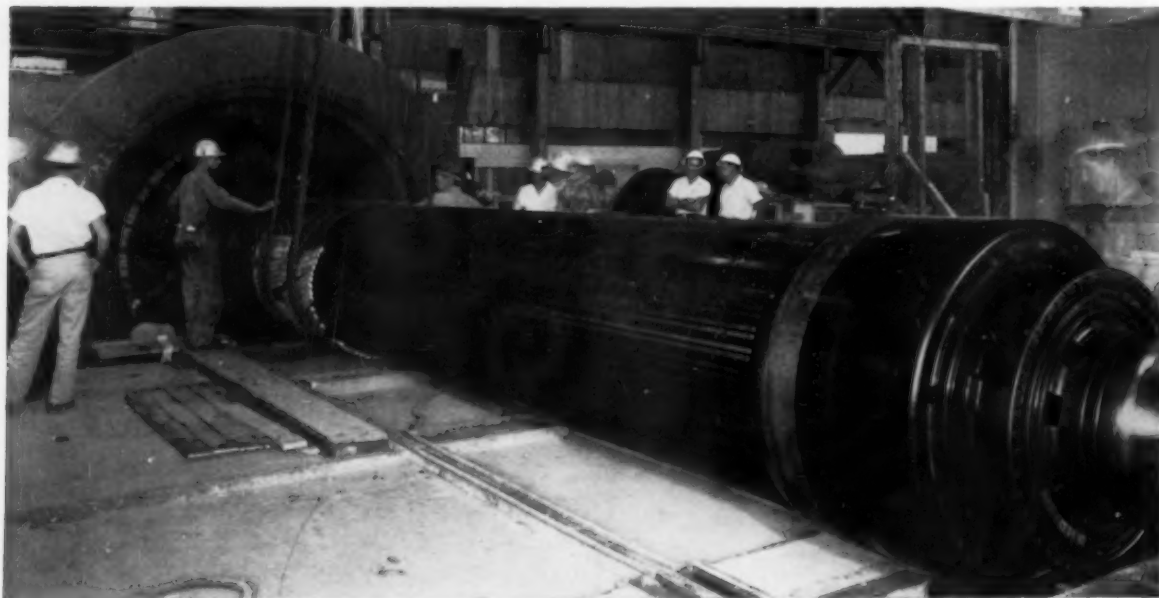
There are nine re-heat boilers, four capable of producing 1,000,000 pounds of steam per hour and five 1,280,000 pounds of steam per hour, the five larger boilers being of the controlled circulation type.

The 9-unit plant, if operated at 80% plant load factor, will consume 11,750 tons of coal per day

or over 4,000,000 tons per year. The circulating water pumps are capable of supplying 1,038,000 gpm from the intake channel on the Emory River through the nine condensers and other water-cooled equipment, and out through the discharge channel to the Clinch River.

The deep water at the north end of the condenser water intake channel is much colder than

Installation of rotor in 200,000 kw units



PRINCIPAL EQUIPMENT

TVA Kingston Steam Plant - Latest Units

GENERAL The following equipment list gives details on only the latest 5 units rated at 200,000 kw each. Data on the four earlier 150,000 kw units is not included. Capacity of the entire plant (9 units) is 1,600,000 kw.

STEAM GENERATORS

Boilers	5—Combustion Engineering, Inc., twin furnace, reheat, controlled circulation, 1,280,000 lb steam per hr, 1840 psig, 1053 F, 88.46% efficiency. Steam drum 66" id.
Furnaces	Combustion Engineering, controlled circulation, water wall, dry bottom, 69,400 sq ft heating surface.
Superheaters	2 - stage Elesco, 2" od tubes, 143,000 sq ft heating surface.
Economizers	Elesco, horizontal flintube, parallel flow, 25,800 sq ft heating surface.
Reheaters	Vertical, continuous flow, 28,600 sq ft heating surface, 1,116,000 lb per hr, 500 psig, 1053 F.
Air Preheaters	Air Preheater Corp., continuous, regenerative, counter flow, 114,000 sq ft heating surface, 650 and 300 F gas temp, 80 and 532 F air temp.
Burners	Adjustable tangential, 24 per unit.
Pulverizers	C. E. Raymond, 6 per boiler.
Feeders	Raymond, integral with pulverizers.
Comb. and FW Controls	Republic Flow Meters, Co., electronic-pneumatic.
Superheater Controls	Leeds and Northrup, burner tilt and desuperheater.
Dust Collectors	Day Company, 4500 cfm Cyclone at coal bunkers, and 1800 cfm at coal scale.

DRAFT EQUIPMENT

Forced Draft Fans	Westinghouse (Sturtevant), Div., 270,000 cfm, 13" pr, 140 F, inlet louvre control. Driven by 700 hp, 705 rpm, squirrel cage motors.
Induced Draft Fans	Westinghouse (Sturtevant), 400,000 cfm, 20" pr, 320 F, inlet louvre control. Driven by 1650 hp, 593 rpm, squirrel cage motors.

ASH HANDLING

Method	Fly and bottom ash collection and disposal to diked area in lake.
Fly Ash Collectors	American Blower Corp., mechanical, 310,000 cfm at 295 F, 3" water pressure drop. Peerless Pump Division, 520 ft head pumps.
Bottom Ash System	Allen - Sherman - Hoff, V-type hoppers with water sluice. Byron Jackson Co. pumps, 1000 ft head.

TURBO-GENERATORS

Turbines	General Electric Co., tandem compound, triple flow exhaust, reheat, 3,600 rpm, 180,000 kw, 1800 psig, 1050 F. Reheated steam 347 psig, 1050 F. 24 Stages, back pressure 2" Hg. abs. Heat rate 7777 Btu per kw.
Generators	General Electric, 200,000 kva, 180,000 kw, 0.9 pf, 20,000 volts, 3600 rpm. Hydrogen cooled, 15 psig at rated capacity, 30 psig max. Excitation by rotating amplifier, 500 kw, 275 v, 890 rpm, shunt wound, direct connected. Pilot exciter 5 kw, 1800 rpm motor-driven amplitudyne type. Neutral grounding transformer 75 kva, 20,000/220 v. Lightning arrestors only for surge protection.
Generator Leads	Unit type, no switching at generator voltage, 70,000 amp, aluminum channel buses. Indoor buses enclosed in transite, segregated phase; outdoor—expanded aluminum on aluminum frame and steel supports. Designed and fabricated by TVA.
Turbine Room Crane	2—Cyclops Iron Works, 80 tons.

AUXILIARY POWER

Common & Unit Boards	Westinghouse 4160 v, 250,000 kva, ITE 480 v, 25,000 amp.
Control Batteries	Electric Storage Battery Company, 250 v, 25-plate, heavy-duty, glass-cell.

CONDENSING EQUIPMENT

Condensers	Westinghouse, surface, single pass, divided waterbox, 887,000 lb per hr each, 2" Hg. abs, 121,400 gpm each, 7 ft per second, 80,000 sq ft, 11.742 tubes 30 ft long and 7/8" od, admiralty metal by Scoville Mfg. Co.
Circulating Pumps	Fairbanks Morse & Co., 2 per unit, 65,000 gpm, 21 ft head, 54 inch. Driven by 450 hp, 318 rpm Westinghouse motor.
Traveling Screens	Chain Belt Co.
Gantry Crane	Pacific Coast Eng. Co., 15 tons.
Conduits	Lock Joint Pipe Co.

FEEDWATER EQUIPMENT

Closed Heaters	Griscom-Russell Co., 7 per unit, horizontal, High pressure 2900 psig, low pressure 250 psig.
Deaerating Heaters	Worthington, tray type, 85 psig.
Evaporators	Griscom - Russell, horizontal, single effect, 2600 lb per hr, 85 psig. Tubes 250 psig, 950 F, 304 stainless.
Boiler Feed Pumps	Worthington Corp., 1445 gpm, 6305 ft head. Driven by 3000 hp, 3570 rpm, Electric Machinery Co. motors.
Condensate Pumps	Westinghouse, vertical, deepwell centrifugal, 5 - stage, 2250 gpm, 470 ft head. Driven by 400 hp, 1170 rpm Westinghouse motors.
Sodium Phosphate Pumps	Milton Roy Co., duplex plunger type, 24 gph, 2900 psi, 5 hp motor.
Sulphite & Hydroxide Pumps	Milton Roy Co., duplex plunger type, 1 head for sulphite and 1 for caustic, 3 gph at 700 psi each head, 1/4 hp motor.
Water Softening Plant	Hungerford & Terry Inc., zeolite system 320 gpm.

AIR CONDITIONING

Powerhouse & Shop	Nevinger Mfg. Co. Inc.
Office Area	York Corp., central water chilling type.

COAL HANDLING (ENTIRE PLANT)

Locomotives	2—Baldwin-Lima-Hamilton, and 3—General Electric, diesel-electric.
Car Dumpers	1—Heyl & Patterson, Inc., and 1—Wellman Engrg. Co., Max. cap. 70 ton car, 18 cars per hr.
Scales	2—Fairbanks, Morse & Co., 162.5 ton rail scale, and Howe Scale Co., 50 ton truck scale.
Crushers	2—Stephens-Adamson Mfg. Co., and 2—Jeffrey Mfg. Co., 500 tons per hr each.
Tractors	International Harvester Co.
Scrapers	Bucyrus-Erie, cable operated.
Dust Collector	American Air Filter Co., Wet type, 20,000 cfm.
Conveyor System	Rail conveyors: Link-Belt Co. Belts: B. F. Goodrich, Vibrating feeders: Jeffrey Mfg. Co., and Syntron Co. Belt scales: Fairbanks, Morse & Co.
Electrical Controls	Allis-Chalmers Mfg. Co., 4160 v board for 250 hp crusher motors, and 480 v board for smaller motors.

ELECTRICAL EQUIPMENT

Air Conditioning (Control Room)	Worthington Corp., 30 ton.
Switchboards	Allis-Chalmers Mfg. Co.
Power Transformers	Allis - Chalmers, 19/161 kv (forced-oil, forced-air cooled), 220,000 kva.
Common Aux. Transformers	General Electric (oil immersed, forced-air cooled) 161/4.16 kv, 20,000/25,000 kva.
Unit Aux. Transformers	Westinghouse (oil immersed forced-air cooled), 19/416 kv, 12,000/16,000 kva.
Disconnect Switches	Southern States Equipment Co.
Circuit Breakers	General Electric Co., 1600 amp 10,000,000 kva interrupting cap., 3/20 cycle reclosing.
Lightning Arrestors	General Electric, 161 kv circuit.

TVA Kingston Steam Plant

(Continued from previous page)

the surface water. A skimmer dike has been constructed to utilize this deep cold water in the condensers for more efficient plant operation.

The first four 150,000 kilowatt turbo-generators were furnished by the Westinghouse Electric Corporation, and the last five 200,000 kilowatt units by the General Electric Co. All boilers were furnished by Combustion Engineering, Inc.

A force of about 350 men is required to operate the plant which was completed at a cost of about \$213,000,000.

Watts Bar Lake, upon which the plant is located, is 72.4 miles long with an average width of 0.83 mile and a shoreline of 783 miles. The full pool level is 741 ft above sea level. The lake area at this elevation is 38,600 acres.

The 160,000 volt transmission lines, strung on tall steel towers, carry power from the plant across seven miles of scrubby hills to the Atomic Energy Commission's facilities at Oak Ridge.

As great as Kingston's Steam Plant production is, it alone cannot satisfy the Oak Ridge demand

because the AEC plants at Oak Ridge have a demand of approximately 2,000,000 kilowatts.

More than 22,000,000 man hours of planning, designing, construction and secondary services went into this TVA giant.

Coal per kwh figures from several TVA plants show how much more efficient modern plants are than those built years ago. It takes two pounds of coal to produce one kilowatt-hour of power in an old steam plant at Nashville which TVA bought from the Tennessee Electric Power Co. Johnsonville Steam Plant, TVA's first big post-war job, uses .85 of a pound of coal to produce a kilowatt-hour of power. But the Kingston plant uses only .78 of a pound per kilowatt-hour.

About 75 per cent of the coal is shipped to Kingston by train, the rest by truck. A large revolving mechanism grips a loaded coal car, picks it up and dumps its contents. The coal goes into deep underground pits. It is crushed to walnut size and carried by underground conveyor to the coal yard, where TVA tries to keep enough coal for a 90-day supply.

Before it is used, the coal goes underground again where it is pulverized and blown into the furnaces.

Ashes from the plant are carried away in water through nine 10-in. pipes which discharge into a diked-in section of the lake, used as the ash disposal area.

The inside portion of the plant is quite attractive. Doors are of birch plywood. Floors are terrazzo, with large chips of marble instead of the usual small ones. Also TVA is putting as much beauty and eye appeal around the exterior of the plant as possible.

Expansion Briefs

Shell Chemical Plant—Houston

Steel erection for **Shell Chemical Corporation's** new resin development facility at Houston, Texas, has been completed two weeks ahead of schedule, according to **Walter Kidde Constructors, Inc.**, the engineers and builders.

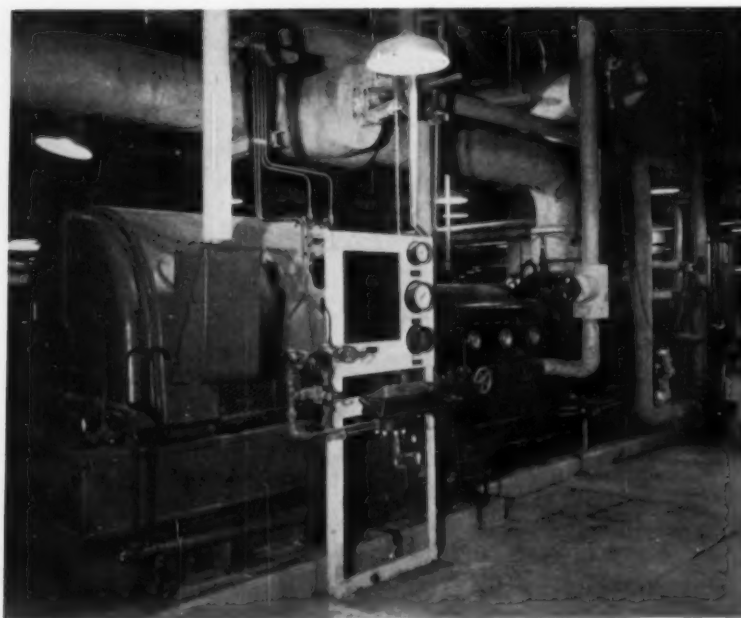
Expected to be ready for operation by April, 1956, the unit will provide market development quantities of resins and related products. Unusual flexibility in piping and equipment layout will permit process changes to be made quickly and easily.

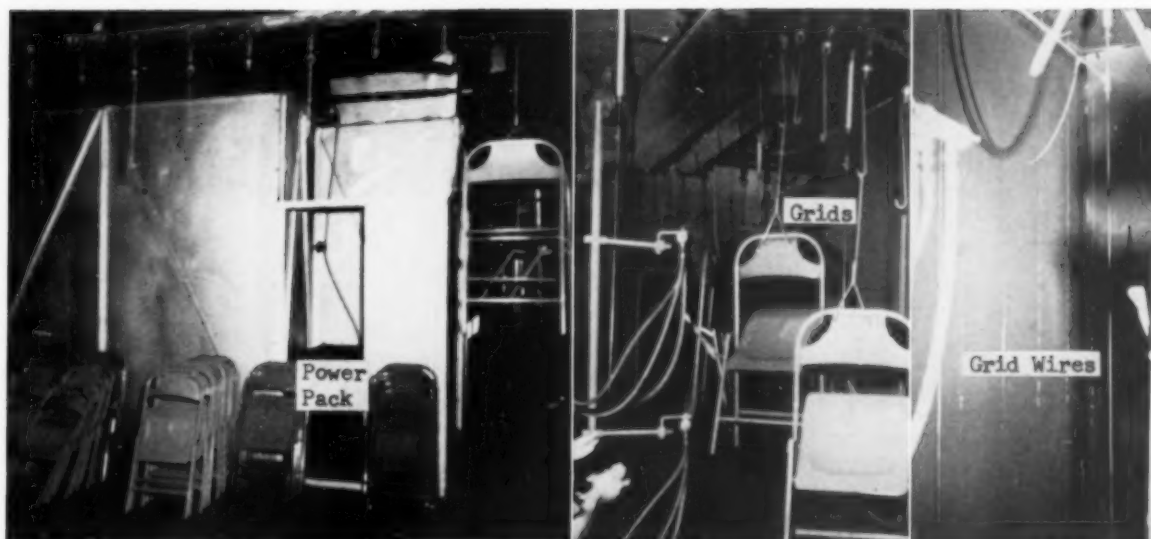
Houston, Texas, Plant for Chiksan Company

The Well Equipment Mfg. Corp., an operating division of Chiksan Company, has announced plans for the manufacture of Chiksan swivel joints and flexible line assemblies in a new plant to be constructed in **Houston, Texas**. Chiksan Company is a subsidiary of Food Machinery and Chemical Corporation.

The expansion will provide Chiksan customers with a second manufacturing source for Chiksan swivel joints as well as increased production of Weco products. The Weco Division's present Houston plant manufactures a complete line of wing unions, snatch blocks and other specialty items. Chiksan swivel joints are now produced in the Company's main plant in Brea, California.

Boiler feed pump for unit 5





NEW METAL PRODUCT painting system at Carolina Metal Products' Charlotte, N. C., plant. Paint booth (left), enclosed by sheet metal partitions, contains a battery of spray guns. Power pack feeds grids which produce electrostatic field inside booth.

TWO WIRE GRIDS on opposite sides of the conveyor line (center photo) generate field of static electricity which fosters attraction between paint and metal chairs. Closeup at right shows one of the grids in paint booth. Grids operate on approximately 6 volts and 15 amps.

Electrostatic Painting at Campco — N. C.

AN ELECTROSTATIC painting system increases production of painted metal products 50% on some items and more on many others at Carolina Metal Products, Inc., Charlotte, N. C. Increases in production up to 100% are expected on many items upon gaining further experience with the equipment, according to officials at Campco.

Products made by Campco include: Wix oil filter housings, steel folding chairs, formed steel lintels, fireplace dome dampers, steel school desks, and school bus stop signs.

In painting metal chairs, conveyor speed was nearly doubled for use with the electrostatic paint booth. This system completes the painting operation much faster than it could be done by hand spray. Production increased 60% in painting chairs with the new painting system.

The electrostatic painting sys-

tem was supplied by the Ransburg Electro-Coating Corp., Indianapolis, Indiana. Electrostatic painting is the last step in treating the manufactured products preparatory for packaging and shipping at Campco. Other steps in finishing fabricated products here include washing, degreasing, and phosphatizing. The Oakite CrysCoat process is used for phosphatizing in this instance.

Installation

The paint booth, enclosed by sheet metal partitions, contains a battery of spray guns which are manually controlled at this plant. Two wire grids (on opposing sides of the conveyor line in the paint booth) generate a field of static electricity from 220 volts fed to a power pack which feeds the grids approximately 6 volts and 15 amps.

The metal products being painted are charged with static elec-

tricity, thereby attracting the paint particles in a uniform film over the entire area of the product. This eliminates overspray, as in hand spraying, and reduces the quantity of paint used by eliminating waste usually caused by overspray. Most of the paint is attracted to the object being painted instead of being lost to a water-fall and exhaust system.

Paint savings have been realized from a minimum of 30% on complicated shapes to a high of 60% on some items, as a direct result of adoption of the electrostatic painting system. Baking enamels and synthetic lacquers are used primarily here in a wide variety of colors.

In addition to the extensive line of metal products previously mentioned, Carolina Metal Products, Inc., serves Southern industry with a complete metal stamping engineering service — from design to finished product.

Fire hazard reduced in Maryland plant . . .

Inert-Gas-Filled Motors for Safety

THREE 350 HP, totally enclosed, inert-gas-filled motors at the Baltimore Refinery of the Esso Standard Oil Company have been put into operation driving hydrogen compressors. The motors were designed and built for maximum protection against explosion of hydrogen due to sparking.

Each of the motors is built with a practically gas-tight enclosure. This enclosure is made as gas-tight as possible by the following precautions:

1. "Blind" holes are used where bolts enter the outside of the enclosure. (Bolts holes are drill-

ed and tapped in the heavy steel frame, without going entirely through the metal.)

2. A machined "surface fit" where the bearing brackets attach to the motor housing eliminates need for gaskets.
3. Gas tight, continuous welds are used throughout during the fabrication.
4. Oil-pressure gas seals in the bearings make the bearings practically gas tight. The seals are virtually non-wearing and require no more attention than long life sleeve bearings.

Inert gas is maintained inside the enclosure at a slight positive pressure so that the slight leakage of gas through the motor is of inert gas going out instead of explosive gas going in.

The motors are cooled by circulation of the inert gas. Gas-to-water coolers are mounted near the top of the enclosure.

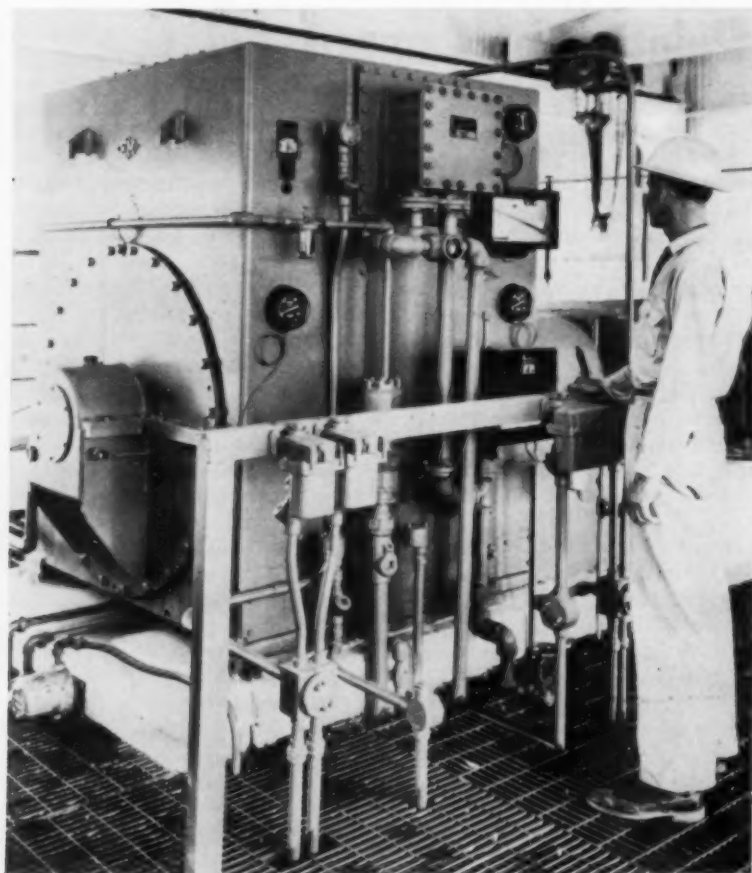
The sleeve bearings are flood lubricated (a combination of forced-feed and oil ring methods). Because oil rings are furnished, the motor could operate indefinitely after failure of the pressure oil supply, without damage to bearings.

A high degree of protection for these motors is provided by special instruments and controls which permit the operator to check the functioning of the motor at a glance. Standard safety features include: (1) Inert gas pressure and temperature gages, and relays with alarms and/or shutdown contacts; (2) Rotating-type indicators for oil feed to bearings; (3) oil level sight gages on oil reservoir and bearing housing; (4) purging valves for start-up.

Optional features on these motors include: (1) Water cooler with double-tube construction; (2) Liquid level detector switch; (3) Bearing temperature relays; (4) Water flow indicator; (5) Special explosion-proof potheads, conduits, etc.

The motors, built by Electric Machinery Mfg. Company, Minneapolis, drive Ingersoll-Rand Reciprocating Compressors.

Inert-gas-filled motor installation in Esso Standard Oil Co. plant, Baltimore, Maryland.



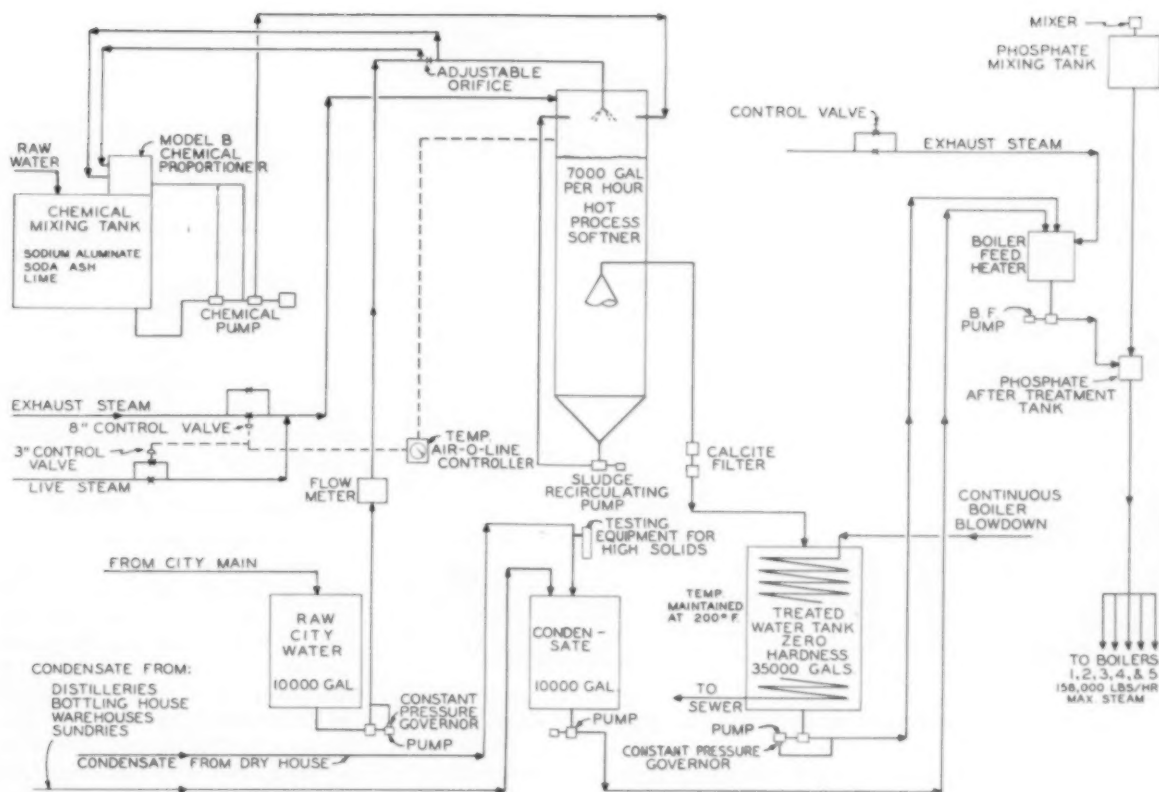


Diagram of Feedwater Makeup System

Louisville Plant Improves Boiler Water

Utilization of Conditioning Equipment

A PLANT Expansion Program in the fall of 1945 made it necessary for Schenley Distillers, Inc., to increase boiler capacity at its Louisville, Ky., plant.

As the boiler water treatment system was designed for only 7,000 gallons of 0 hardness water per hour, the increase in steam requirements apparently necessitated the purchase of new and larger equipment. To do this it also would be necessary to enlarge the present building space — almost impossible because we already were crowded for space.

Our next thought was, what could we do to our present equipment?

After some study, we decided to

By **ROBERT W. COOPER**

Power Plant Engineer
Schenley Distillers, Inc.
Louisville, Kentucky

install a 35,000 gallon storage tank just outside the power plant building, and operate softening equipment twenty-four hours per day at 7,000 gallons per hour. This was possible because the main load on the boilers would start dropping off around 7:00 P. M., allowing approximately six hours to refill the storage tank for operation around 1:00 P. M. next day.

This was fine, but we would rob this tank and at times over-rate the system, which would cause the

hardness of the water to increase. Although we were returning some condensate, we just had to have more water.

Condensate Recovery

We then started a complete check of all sources for condensate recovery. This check covered both distilleries, the dry house, bottling house, warehouses and all heating systems.

We changed condensate piping where possible to bring all usable condensate to the present 10,000 gallon condensate storage tank just outside the power plant building. We then pumped this condensate at a continuous rate directly to the main feed water heater. Then we

installed a constant pressure governor on the treated water make-up pump to maintain a constant level on the feed water heater.

After the above improvements, we had to increase the feed water temperature. This we did by installing in the exhaust steam line, which feeds the heater, a normally closed diaphragm control valve to isolate the exhaust steam of the boiler feed turbines and of Nos. 1 and 2 forced draft turbines from the main exhaust system.

By bleeding off the excess steam from the isolated system into the main system, we saved the amount of live steam ordinarily required by the heater.

Temperature Control

We were then confronted with maintaining a constant temperature on the treated water sedimentation tank. To solve this problem, we installed in the exhaust steam line to this equipment an 8-inch normally open diaphragm control valve. At certain times, however, the amount of exhaust steam would decrease and the water temperature would drop, giving us a poor control of the chemical proportioning.

The next step was to install a 3-inch normally open diaphragm control valve in the main steam line to this equipment. We then interconnected an Air-O-Line temperature controller to both valves and adjusted each valve so that, after all exhaust steam was used, the live steam would take over. This gave a straight line control at any set point.

Chemical Proportioning

Next we experienced trouble proportioning chemicals at the rate necessary to maintain 0 hardness water at all load changes. We then purchased a new Model B Proportioner to replace the old Model A that had been installed for a number of years, and also replaced the control orifice plates with an adjustable type. With this new type equipment, which gives very sensitive control, we had this job licked.

Carry-Over

We then had trouble with all boilers going wild — water foaming and carrying over. Every check

possible was carried out. Finally we found that the trouble was being caused by water from the condensate tank. A test of this water indicated that it contained spent mash. The trouble was traced to the dry grain recovery evaporators in the dry house. The momentarily high vacuum in the evaporators, created when they were started after shutdown, would cause small amounts of spent mash to be pulled over.

Therefore, to warn the operators in the power plant that spent mash was being pulled over, we installed a Solubridge ppm continuous sampler in the condensate line. This sampler was set to sound an alarm at five parts per million. The alarm would give the operators time to turn this source of condensate to the sewer before it could cause any trouble.

After-Treatment

As all the make up water we use for the boilers is from the city mains, we were experiencing drifting hardness before treatment. We were afraid this might cause trouble. We noticed the hardness of the boiler water would vary as the hardness of the city water varied. To assure us that the boiler water would remain constant at 0 hardness, we applied a polyphosphate after-treatment.

To handle the after-treatment we installed a chemical mixing tank with a Lightning mixer, and on the boiler feed pump discharge line we installed a manifold with valves. Then we ran a pipe to each boiler and connected it directly to the boiler water inlet piping beyond all feed water level controls. These improvements eliminated the drifting hardness.

Anti-Foam

As we had to use city water for boiler make up, we were interested in trying to reduce some of this cost. We then started reducing boiler blowdown. By doing this, we knew we would automatically increase the dissolved solids of the boiler water.

With this problem, we contacted the chemical company that handles our boiler water treatment. They suggested that we go to an anti-foam material. Upon use of

this material, we were able to increase the dissolved solid from 125 to 225 grains per gallon.

We then utilized the heat from the continuous boiler blowdown by installing copper coils in the treated water storage tank. By doing this we were able to maintain a constant temperature on this storage water. This reduced the exhaust steam needed to operate the feed water heater and also gave us more exhaust steam with which to heat the water softener. This procedure reduced the amount of live steam necessary to make up the difference in temperature in this system.

Recirculation of Sludge

From time to time we also were having trouble with cloudy water coming through the treated water filters. After some study, we decided that this water condition was caused by failure to get complete reaction from all chemicals in the sedimentation tank. We then tried recirculation of sludge. We were satisfied this would work if we could find a pump that would handle both hot and caustic water.

With this problem, we went to the water softener company's agent. With the help of the agent and a pump manufacturing company, we were able to get a special type pump. After this special pump was installed and placed in operation, we were able to produce clear water and also reduce our chemical cost approximately eight per cent.

Results

After all these changes were completed, we realized the importance of starting a training program for operators who handle this equipment and the analysis of the water. Our first job was to get these men to understand just how important this was to them, the equipment, and the company. We have been very successful with this program. The operators have turned out to be very capable and have a very good understanding of the importance of this work. We also have been able, through this water program, to reduce our boiler cleaning from every sixty days to once every year. In fact, it is no longer necessary to turbine boiler tubes at all on a regular schedule.

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Discussion from Readers on

Questions and Answers for Industrial Electricians

ON THE WHOLE, readers have commented favorably on the above article by Robert U. Garrett. (See SP&I for December, 1955, pages 48-49). The editors present two readers' letters and the author's replies.

DEAR EDITOR:

I am writing you in regards to your article on "Questions & Answers for Industrial Electricians," which I think was very good. However, I would like more information about question No. 14, which reads as follows: "Name three (3) of the most common methods of changing the speed of an induction type motor." The first two answers you gave I agree on, however, I would appreciate if you would clarify how you can change the speed of an Induction type Motor by Shifting Brush Positions on Armature.

G. E. Webb, Electrician Foreman,
Atlas Powder Company,
Box 1068, Chattanooga, Tenn.

REPLY TO MR. WEBB:

Possibly Mr. Webb has a point here. I've heard it debated whether a series (Universal) motor is technically classed as an induction type motor.

The Pros have it that due to the internal induced magnetic effect, it is a form of induction motor; the Cons hold that as the current is the same in all sections of a series circuit — i.e. in this case fields and armature — induction as such plays no part. I would like to have clarification myself on this point, if someone will give it.

As to actual brush changing, the procedure is fully discussed in Standard Handbook for Electrical Engineers, 8th Edition, Section 7, Pages 282-291. (Ref. Page 285 'Brush shifting poly phase shunt motor — Schrage design.') Also in Section 17, Page 573. In Ameri-

can Electrician's Handbook by Craft, 6th Edition, Page 865, are listed six speed changing methods, but brush changing is omitted.

In including this method, I had in mind: 1) The old type vertical mounted Hoover vacuum cleaner motor whose brush rigging assembly ring can be varied and in re-assembly after an overhaul, must be correctly positioned; 2) Some Hamilton-Beach fractionals use this method exclusively; 3) On some repulsion-induction motors the frames are bench marked for rotation and moving the ring assembly reverses the direction, with a decrease in speed if off-center. This question was formulated to test the applicant's knowledge of the re-assembly of some motors after a repair or an overhaul.

Robert U. Garrett

GENTLEMEN:

I want to add my commendations to the hundreds I am sure you will get on Mr. Garrett's article, "Questions and Answers for Industrial Electricians" in the December issue. I think this is an excellent idea, and I would like to see it extended to include Pipe Fitters and Power Plant Operators, and you might be able to go as far as to include Junior Engineers.

I would also like to ask Mr. Garrett some questions about his question No. 18 (C). I can't conceive of running a three wire 230 volt circuit to feed only a 200 watt lamp, and a 25 watt lamp, and so assume that there must be at least two or three kilowatts load on this system — assuming for the sake of argument that we have twelve

hundred watts on one side of the system, and 1025 watts on the other side, representing the unbalance which he states in his question, would the overvoltage on the 25 watt lamp then be only 10% rather than the 800% which he states in his question, if the neutral line is opened? I understand quite clearly the point Mr. Garrett is trying to make, but am wondering if his question is not slightly ambiguous.

Please send me two sets of tear sheets of this article if they are available.

John C. Porter, Power Engineer,
Rock Hill Printing and
Finishing Company,
Rock Hill, South Carolina.

REPLY TO MR. PORTER:

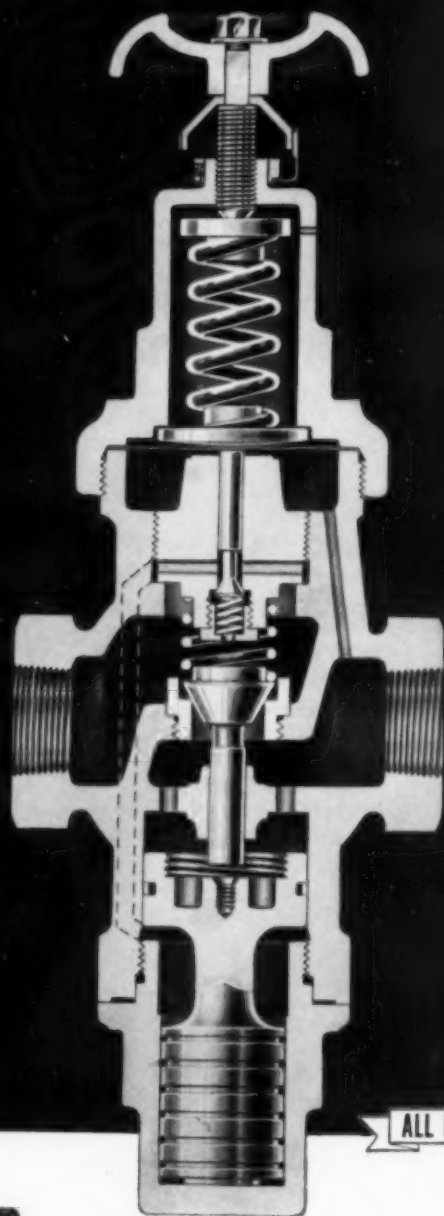
I agree with Mr. Porter that it is indeed impractical to run a 3-wire branch circuit for only a 200 watt and 25 watt load. His estimate of a 1200 watt and 1025 watt load does mean an unbalance of 175 watts, just as a 260 watt and a 25 watt load still leave 175 watts. However, as the load increases, it would be analogous to using a 150 watt lamp in place of the 25 watt, in which case the resistance of the 150 watt would be roughly only slightly less than the 200, in which case the 150 would be operating on only about 10% over-voltage.

Let's consider a concrete and practical example:

A room has 12,200 watt incandescents, separately canopy-switched and fed by a 3-wire 115/230 volt branch circuit from a 2 pole multi-breaker. The system is balanced out in two parallel runs with 6 lamps on each side. Now, 5 lights on one side are switched off, leaving one 200 burning on that side and six 200's burning

(Continued on page 52)

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Questions and Answers for Electricians

(Continued from page 50)

on the other side, the neutral handling the unbalance. An electrician working in or on the panel inadvertently disconnects the neutral of these circuits. We then have a series-parallel condition in which one 200 watt is in series and six 200 watters in parallel.

Leaving out theory, for all prac-

tical conditions we have one 115 volt incandescent operating on 230 volts and it goes bye-bye very shortly. Its resistance is six times higher than the combined multiple resistances of the other six lamps.

This question was formulated to test the applicant's ability to bal-

ance out and also his knowledge of two different resistances in a series-multiple circuit. It was purposely made rather far-fetched and stated as an assumption. If he is cognizant of what happens in this example, it is only a step farther for him to realize the danger of playing fast and loose with neutrals and thoughtlessly opening them without carefully checking the circuits which they balance.

Robert U. Garrett

Tennessee vegetable oil producer conserves space . . .

Unusual Hydraulic Elevator System

A NEW HYDRAULIC elevator system in the country was recently put into operation at the Humko Company of Memphis, Tennessee, one of the largest producers of vegetable oils and shortening in the South.

Designed by the Bluff City Elevator Company of Memphis, the new hydraulic elevator is capable of lifting a section of railroad tracks, including a fully loaded railroad box-car to the second floor of the Humko building.

Depending upon the particular product to be unloaded, the 12 x

60 ft steel platform can be elevated flush with the second floor; or it can be stopped with the box-car door flush with the floor.

Driveways were conveniently arranged so that even trailer trucks can be driven onto the floor.

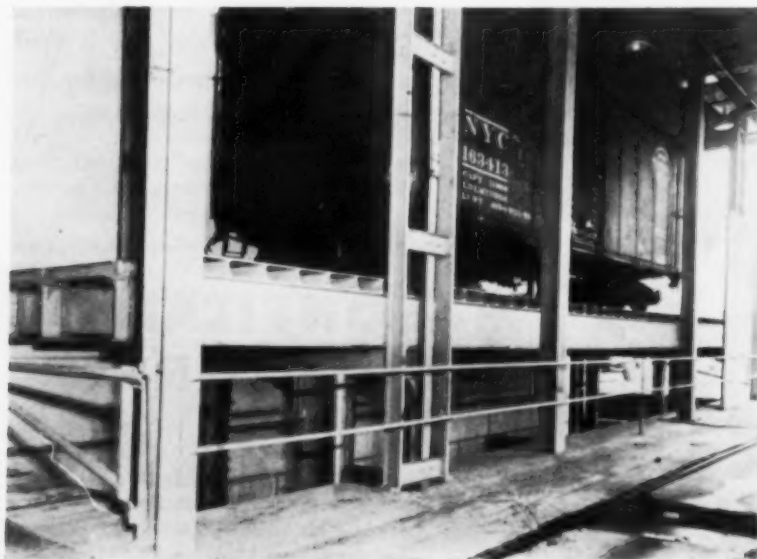
The elevator pit was built on a railroad spur that passed through the building. The platform has 60 ft of standard gauge railroad track built in and weighs 65,000 lb. It has a net load capacity of 120,000 lb when the load is centered.

The application of the hydraulic elevator was originally designed

as a solution to Humko's expansion problem. Construction over the years had utilized all their available surface space and limitations and obstructions on all sides prevented any horizontal growth. With the entire ground floor needed for manufacturing processes the company decided to use the second floor for the necessary storage of new raw materials.

Hydraulic power for the large elevator is dependent upon two Worthington rotary gear pumps, each driven by a 40 hp motor through V-belts. The powerful pumping units are each rated at 230 gpm at 960 rpm. Both take suction from an overhead reservoir, and discharge into a common header.

Even before Humko's new plant facilities went into productive operation, the new elevator started its useful service. Completed well in advance of the rest of the building, job contractors used it to lift loaded ready-mix concrete trucks and other supplies to the second floor.



Unusual hydraulically operated elevator lifts loaded box-car in Tennessee processing plant

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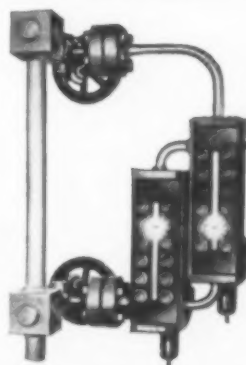
YARWAY's new "wide vision" face gives brilliant readings from any angle . . . and the pointer is always visible, even at extreme high and low water levels.

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steam plant equipment

Electrical Features of Air Conditioning

Motor Drives for Compressors

By **JOHN deB. SHEPARD,* Associate**

**P. L. Davidson, Consulting Engineer
Greensboro, North Carolina**

RECIPROCATING refrigeration equipment is frequently employed in connection with small textile mill operations and will run in size for manufacturing areas from 50 hp up to 150 hp. Reciprocating compressors today are universally designed for unloaded starting and are either designed for operation by direct drive from four or six pole motors or for belt drive from four pole motors. Since the starting torque requirements are relatively light, standard induction motors are an almost universal application in this field and the drive requirements are not unlike those for large centrifugal pumps or air compressors.

Power Demands

For a well loaded textile mill, such as a spinning or twisting operation, the requirement of the refrigeration plant in kilowatts will usually be approximately 25% to 30% of the power demand in the conditioned area, with the horsepower requirement of the compressor being roughly equal to the kilowatt requirement of the entire

refrigeration plant, including auxiliaries. It can thus be seen that 150 hp of refrigeration will not care for a very substantial load.

Most refrigeration applications in the textile field will run in excess of 150 hp or 150 tons and thus fall into the range which is usually most satisfactorily met by the use of centrifugal refrigeration equipment. For such application drives from 200 to 400 hp are quite common and drives up to 1,000 hp are not unusual.

Compressor Speeds

Centrifugal compressors generally operate as multi-stage units in speeds ranging from 7,000 rpm for systems in lower capacity range to 3,500 to 4,000 rpm in higher capacity ranges, and conventional units which have been available for a number of years are generally arranged for coupled drive from four pole motors through suitable step-up gears.

Certain new designs which have

found fairly broad application within the past three or four years employ a two stage system designed for operation at approximately 3,500 rpm with the two stage impellers mounted on extended shafts at each end of a motor which is an integral part of the unit. This motor is completely sealed in the gas passage of the compressor and is either water cooled or gas cooled. Needless to say this type of application is limited to the use of the squirrel cage induction motor.

Other designs recently introduced employ single stage compressors operating up to 12,000 rpm in which instance the drive is generally by means of a two pole motor operating through step-up gears, the 3,500 rpm motor speed being employed to retain a reasonable gear ratio.

Since the units usually represent a substantial horsepower, each application requires special consideration relative to motor starting conditions, motor voltage, etc.

Motor Voltage

In most industrial applications the question of motor voltage will be settled by the characteristics of the power supply system. In large plants which may be served with secondary power at 2300 to 4160 volts with a high tension plant distribution system and unit transformer load centers, it is obvious that consideration should be given to the use of the plant primary voltage for drive of large motor units.

For example, we recently completed an installation of a 800 hp induction motor for refrigeration drive at 4160 volts, and the full load current on this motor stands at the surprisingly low figure of 93 amps.

We have a number of applications employing 2300 volt drive motors in the range from 400 hp

*Abstracted from Electrical Features of Air Conditioning in Textile Mills, presented at the A.I.E.E. Textile Conference, North Carolina State College, Nov. 1955.

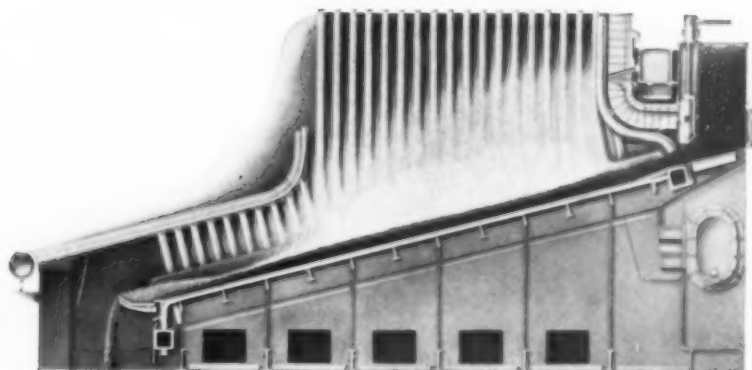
Representatives at Conference on Electrical Equipment

M. E. Campbell, Dean, School of Textiles, N. C. State College; **R. L. Gafney**, Cranston Print Works Company, Fletcher, N. C.; **Barry P. Roberts**, Sterling Cotton Mills, Inc., Franklinton, N. C.; **M. C. Decker**, Beacon Manufacturing Co., Swannanoa, N. C.; and **Edward Beck**, Westinghouse, East Pittsburgh, Pa.



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and up. In commercial applications similar circumstances frequently arise.

We recently installed 1500 hp of refrigeration as three 500 hp units together with 500 to 600 hp of auxiliaries in the Public Ledger Building.

This requirement just about doubled the total load of the building and required new service which was taken from Philadelphia Electric Company as 13,000 volt primary service. The three 500 hp refrigeration compressors were served from a transformer bank at 2300 volts secondary, and the auxiliary power equipment was fed from a separate bank at 440 volts secondary.

Contrawise, it is sometimes necessary to install larger motors at low voltages due to power supply considerations. A recent application involved the installation of a 600 hp compressor drive on 220 volts, a procedure which is obviously to be avoided if possible.

Starting Equipment

The starting requirements of centrifugal compressors from the torque standpoint are generally light. All these systems are equipped with dampers in the gas passage which can be operated to limit pumping load on the impeller during the accelerating period.

The actual torque requirement on any given machine will depend upon the particular compressor design but units can generally be started and accelerated with 50% of full load torque or in some instances lower. However, because of the relative size of the motor units involved, starting current considerations must be studied carefully with respect to the power company requirements and the plant system. In some instances system characteristics may permit the occasional high inrush caused by starting these devices across the line.

In this connection it should be pointed out that with intelligent operation it should seldom be necessary to start one of these large units more than once a day. Occasionally these units are set up for automatic start from thermostatic response but more generally their operation is by manual start.

Once the machine is on the line,

external control means are available to permit its remaining on the line even though the weather requirement calling for operation may be relieved. Thus if conditions warm during a spring afternoon to a point where operation is considered necessary, the machine can be held on the line satisfactorily until such time as the cool of the evening permits the machine to be stopped without hurting plant conditions.

Under these circumstances power companies are frequently willing to allow considerable latitude in starting inrush. For example, the 800 hp, 4160 volt drive referred to is actually a line-start operation and employs a squirrel cage induction motor.

We have recently employed a number of part winding, increment start induction motors in drives up to 500 hp. Such a motor will develop sufficient torque on half winding to satisfactorily start the centrifugal unit at an inrush of approximately 60% of normal full load inrush.

The starting equipment is extremely simple, consisting of two normal magnetic line contactors with individual overload protection and a suitable time delay relay interposed to delay closing of the second contactor until the driven device reaches part speed, at which time the full winding is applied across the line with no interruption in current flow. However, these motors have rather peculiar characteristics during the starting phase and each individual drive must be carefully investigated to determine the maximum anticipated inrush during starting interval so that this may meet the power company requirements.

Generally speaking, there is no objection to starting centrifugal units across-the-line, though in some instances the manufacturers like to investigate the starting torque characteristics of the motor to limit the rate of acceleration of the device in order to permit time for oil circulation to be established before the unit reaches full speed and to afford time for proper operation of safety interlocks.

Where conventional reduced voltage starting means are employed for these units, auto-transformer type starters are generally

preferred because they offer a more favorable ratio of torque to inrush reduction. However, they are substantially more expensive than across-the-line or part winding starting equipment and do not offer any substantial advantage from the standpoint of inrush reduction. They also introduce an interruption in current flow during the starting period unless the Korndorfer closed transition circuit is employed.

Wound Rotor Motors

In instances where starting inrush must be drastically controlled, there is no alternative but the employment of a wound rotor motor which will satisfactorily limit the starting inrush to approximately 150% of full running current.

Such motor and starter combinations are substantially more expensive than any of the induction motor selections noted heretofore. However, where a wound rotor motor is required for starting service it is general practice to purchase it for speed regulation as well, because certain operating economies will be effected in operation of the centrifugal compressor at reduced speed during periods of reduced load.

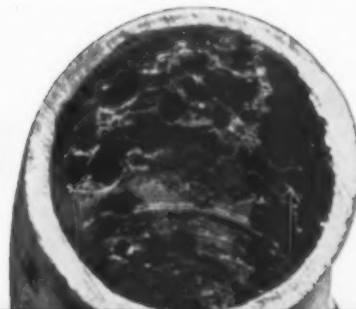
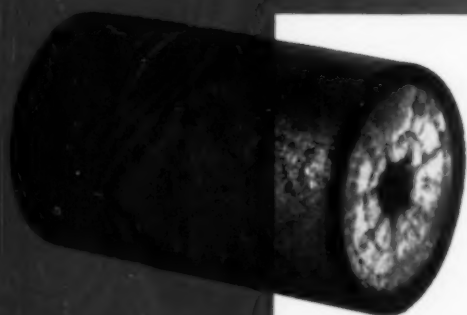
Since the power savings involved are generally in the last bracket of power rate this consideration seldom by itself justifies the use of wound rotor motor with speed control but will generally justify the extra cost of speed regulating starting equipment over equipment selected simply for starting duty.

With constant speed drive motors, control of the output of the centrifugal refrigeration system is achieved by regulation of the compressor suction damper and is usually adequate for most textile mill operations. Even with variable speed operations damper regulation is frequently employed to afford regulation of compressor output between various speed steps and, interestingly enough, the operation of these machines at reduced speeds does not materially increase their stability at low loads.

Power Factor

While many power companies in this area have clauses which make high power factor an important consideration, we note that rela-

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tively few synchronous motor drives are employed for centrifugal refrigeration machines. While in many instances such drives are given serious consideration, the current consensus is that since most industrial plants in these areas have a high induction motor load, capacitor correction of this load is a normal requirement and can be economically extended to correct refrigeration drive power factor.

The large induction motors employed for centrifugal refrigeration drive inherently have a fairly satisfactory power factor and the cost of capacitors required to improve this up to plant level, even during periods of reduced load operation almost off-sets the differential cost of synchronous motor and starting equipment in most cases and presents a considerably less complicated arrangement.

However, a recent development in synchronous motor equipment may tend to change this situation. Taking advantage of the low torque requirement for starting the centrifugal system, certain designers have produced synchronous motors with a high impedance squirrel cage starting rotor, permitting across-the-line starting of the synchronous device at inrushes which are lower than those anticipated with auto-transformers, reduced voltage starting and at a cost for motor and starting equipment which is comparable to the cost of induction motor with magnetic reduced voltage starter.

Circuit Protection

Circuit protection for large refrigeration drive motors can be passed over quickly as the loads involved are sufficiently large to justify individual breaker cubicles in the plant switchboard as well as individual feed to the motor starter, the main breaker being used for circuit protection and cut-out service.

With respect to the use of wound rotor motors it might be well to note that the primary contactor can frequently be replaced by an automatic circuit breaker located at the switchboard and properly interlocked through the drum controller starting point and the various safety devices on the refrigera-

tion system through the special circuits afforded with such breaker to afford over current and under voltage protection. We have two such applications where primary contact for wound rotor motors is made from remotely located circuit breakers in the general plant switch gear bank.

Electrical Control

Electrical or electronic temperature and humidity control systems are available and are frequently used. However, these are more suitable to smaller applications than those we generally consider in textile mill operations.

In this field general preference is for pneumatic control systems. Nevertheless, there are many points where interlock between the control systems and motor starting equipment is required to afford automatic or partially automatic system operation. Generally speaking, such control is effected by means of pneumatic electric switches which serve as relays for starting and stopping the motors operating the various equipment items.

In the case of the centrifugal refrigeration systems or water chilling reciprocating systems, there are generally a number of safety interlocks responding to low suction temperature, high head pressure, low water temperature, low oil pressure, etc., which must be inserted as safety controls in the main starter circuit to stop refrigeration system operation when an unsafe condition exists.

Most of these control relays operating from the pneumatic temperature and humidity control system or from other pressure or temperature actuated devices employ either sealed mercury contactors or light open contactors and the use of low voltage for these control systems should be generally favored.

Accordingly, in many instances consideration should be given to the use of 110 volt or 220 volt holding coil circuits on motors started from external pilot points even though the supply voltage to the motor equipment may be at 440, 550 or even up to 4160 volts.

Furthermore, on systems which are designed for fully automatic

operation close attention must be given to the sequence of operation of the system to assure delayed and orderly start of equipment after an instantaneous power interruption, since, if all primary and auxiliary equipment came on the line at one time, a serious dislocation to the main power supply might result.

In connection with automatic control it is interesting to note in passing that systems affording automatic speed control of variable speed wound rotor drive motors for centrifugal refrigeration systems are employed in certain circumstances affording automatic start and speed regulation to meet the load requirements of the system.

These devices generally operate on the basis of transmitting a thermostatic response to the electrical equipment with switching to increase or decrease speed on a time delay basis sufficient to permit the unit to establish its operating characteristic at the new speed and to transmit this response to the thermostat before the unit is permitted to make further change of speed.

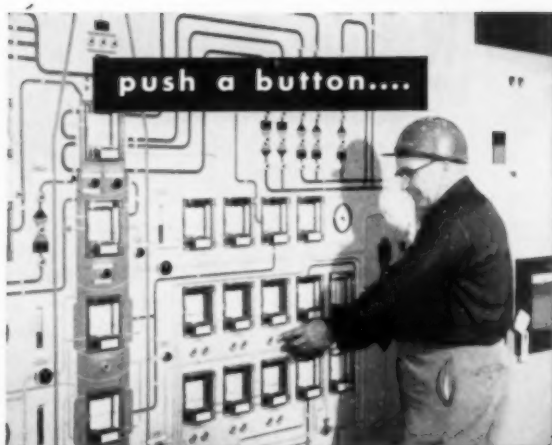
The whole question of control circuits may be summed up by saying that the application of electrical controls is limited only by the number of devices to be controlled and the ingenuity of the engineer making the application.

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Limatorque® Valve Controls Maintain Constant Catalyst Flow in Sun Oil's New Houdriflow Unit at Marcus Hook

To process more than 50,000 gallons of hot oil, 700 tons of cracking catalyst is delivered per hour to the top of this 350 ft. reactor. Limatorque valve operators open and close specially designed mixer valves, maintaining uniform flow of the air-blown catalyst through 12 pneumatic lift pipes. The Limatorque units are actuated by remote, push-button controls at a central control room panel.

Accurate regulation of catalyst flow is vital to the catalytic cracking process. Limatorque valve controllers are handling the job efficiently and effortlessly.

Limatorque motor-operated valve controllers may be actuated either remotely or manually,

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Established 1902

Developments in Uses of Nuclear Energy

By JOHN F. LEE

Professor of Mechanical Engineering
North Carolina State College

Largest Nuclear Power Plant

THE LARGEST nuclear power plant in the world will be located near the junction of the Kankakee and Des Plaines Rivers about 47 miles south of Chicago. The plant will cost a total of \$45,000,000 and will have a capacity of 180,000 kw. Electrical energy will be produced at a cost of approximately one cent per kilowatt-hour as compared with 7.4 mills for a conventional steam power plant. The capital investment will be \$250 per kilowatt as compared with \$167 for a similar conventional installation. Behind these figures there is an interesting story which demonstrates

the power industry's confidence in the future of nuclear power.

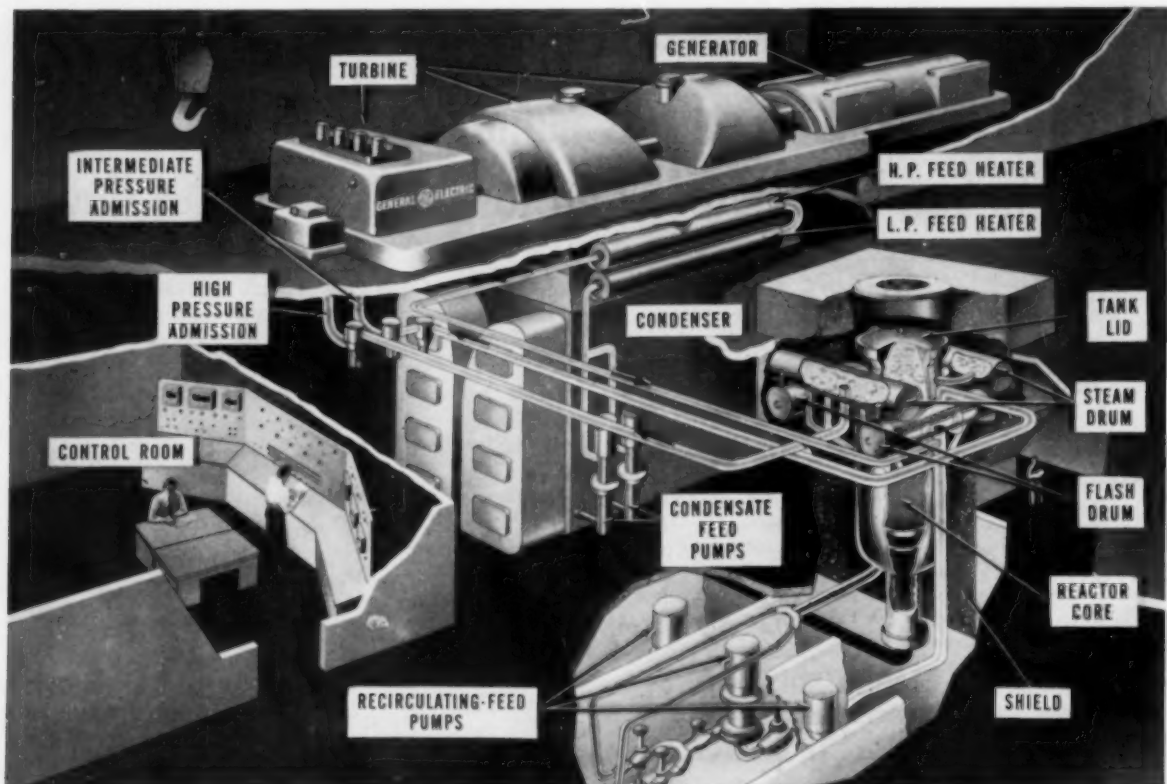
In 1953 a group of public utilities, called the Nuclear Power Group, signed an agreement with the Atomic Energy Commission to study different types of nuclear reactors with the purpose of selecting one or more types which gave promise of producing economic power within the foreseeable future.

This study group was composed of Commonwealth Edison Company, Pacific Gas & Electric Company, American Gas & Electric Service Corporation, Union Electric Company and Bechtel Cor-

poration. Later, Central Illinois Light Company, Kansas City Power & Light Company, and Illinois Power Company joined the group.

On March 31, 1955 the Nuclear Power Group announced that a proposal for the construction of a full-scale nuclear power plant had been submitted for approval to the Atomic Energy Commission by Commonwealth Edison on behalf of the group. On April 10 the site of the plant was announced. On July 22 Commonwealth Edison and General Electric signed a contract for the construction of the power plant. On August 8 the Atomic Energy Commission approved the plans and now the plant is expected to be completed in 1960.

Commonwealth Edison will foot the bill for \$30,000,000, the cost of a conventional steam power plant of the same capacity. The sum of \$15,000,000 will be put up by the other power-company mem-



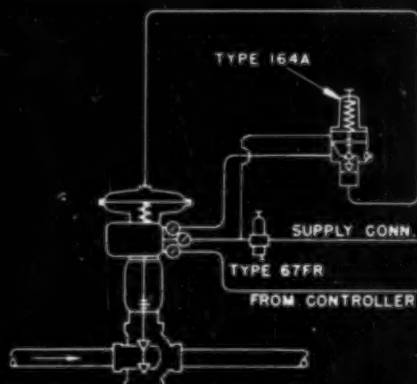
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SERIES 164

For "Gadgeteering" Control

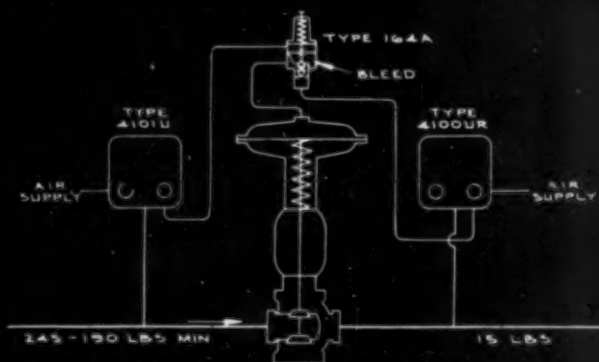
SUCH AS

TWO-WAY ACTION for SAFETY LOCK-UP



Lock-up system using Type 164A to close air circuit to diaphragm of main valve in case of plant air failure. Main valve will be held in position at time of supply pressure failure.

or THREE-WAY ACTION for SWITCH AIR CIRCUITS

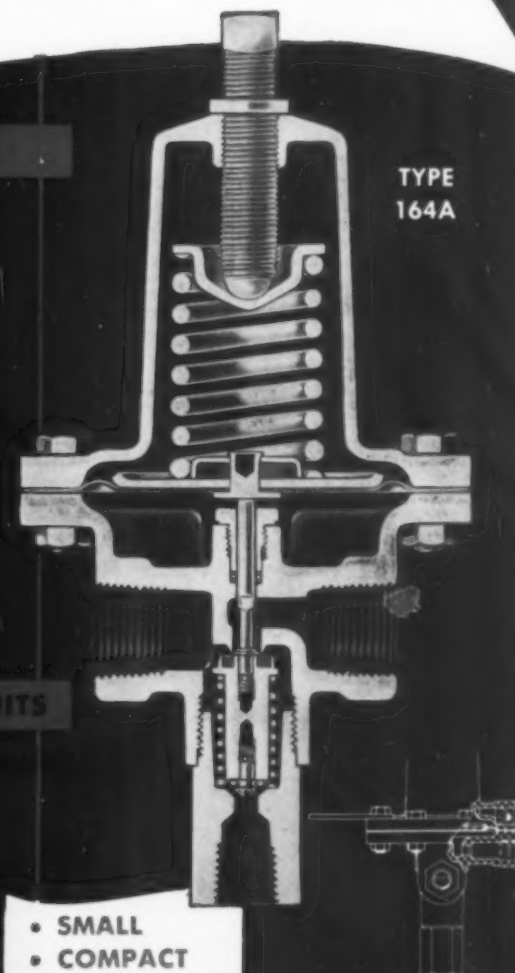


Pressure reduction normally handled by 4100UR Wizard. If inlet pressure to main valve falls below a predetermined amount Type 4101U snap-acting Wizard bleeds pressure off Type 164A switching valve causing 3-way valve to change position so as to close control line pressure and bleed main valve diaphragm pressure to atmosphere. Main valve will stay closed until inlet pressure is restored to desired amount.

FISHER GOVERNOR COMPANY
MARSHALLTOWN, IOWA

CANADIAN PLANT: WOODSTOCK, ONTARIO

WORLD LEADER IN RESEARCH FOR BETTER PRESSURE AND LIQUID LEVEL CONTROL



- SMALL
- COMPACT
- SELF CONTAINED

Side view of Type 164 showing 1/4" Central Line Connection. Control Chamber is separate from body chamber.

SIZES 1/4" or 1/2"

CONTROL SPRING
RANGES PSI

3 to 15
5 to 20
5 to 35
30 to 60

PRESSURE CHANGE
ON DIAPHRAGM FOR
FULL VALVE STROKE, PSI

2
2 1/2
4
5 3/4

MATERIALS

Zinc die cast body and spring case, composition diaphragm and valve disc.

bers of the Nuclear Power Group. All members of the group will share in the technical knowledge, training and experience developed in the construction and operation of the nuclear power plant. Not one cent of government financing or tax advantage is involved.

In brief, the whole venture represents a huge research and development program in nuclear power supported entirely by private funds. Economic power is not expected from this first nuclear plant but the technical know-how developed from its design, construction and operation is fully expected to produce rich dividends when future plants are built. Therein lies the explanation of the figures given in the opening paragraph.

Description of Plant

The accompanying illustration shows a cross section of the equipment of Dresden Station. The principal components of the station will be enclosed in an airtight sphere having a diameter of 200 feet. The sphere is designed so that in case of an accident all radioactive components and fluids will be isolated from the surroundings. A stack provides for ventilation of the sphere under normal conditions

and is closed off in the event of an emergency. The plant will have a heat rate of 13,000 Btu per kilowatt-hour.

The reactor is of the dual-cycle type described in the August issue of *Southern Power and Industry*. Steam is generated in the reactor at a pressure of 600 psia and at a temperature of approximately 950 F. This steam flows directly to the turbine throttle.

Hot water is also withdrawn from the reactor at a pressure of 600 psia and flashes into steam in a flash tank at a pressure of 350 psia. The flashed steam is supplied to intermediate turbine stages.

Subcooled water from the flash tank and water from the feed-water heating system are pumped into the reactor. The heat released in the reactor is divided equally between the steam generated and the water which is later flashed into steam.

The major advantages of the dual-cycle reactor are the elimination of a secondary fluid and the attendant heat exchanger, simpler and closer control under load variations, the impossibility of the reactor running away, and very small size compared with a conventional steam generator.

Gamma Radiation in Industry

THE MOST spectacular and far-reaching peaceful use for the energy released in an atomic reaction is the production of power. Nevertheless, significant progress is being made in a number of other industrial applications of interest to engineers.

More Gasoline

Esso Research and Engineering Company, a subsidiary of Standard Oil Company of New Jersey, announced recently a number of important discoveries which should have a profound effect on process industries in general. Based on fundamental research and pilot plant operation Esso has found that gamma radiation can simplify refining operations, cut production costs and make possible the production of better, and even new, petroleum products.

The most significant finding was the use of gamma radiation in the cracking processes in which gasoline and distillates are produced from crude oil. One possible process, known for a long time, requires high-temperature thermal cracking and makes possible holding residual fuel yield down to only five per cent.

The high cost of maintaining high temperatures and pressures however, and the high capital investment in external heating equipment required for the thermal cracking process have heretofore discouraged its use.

Gamma radiation permits the employment of lower temperatures and the elimination of much of the external heating equipment. As a result, when the radiation process is employed in production we can expect higher yields of

gasoline and distillates and very low yields of residual fuel oils. In fact, the supply of residual fuel oils can be expected to become scarce with a resultant drastic change in the price structure of the various fractions obtained from a given crude.

New Lubricants

Esso also reported the discovery of new lubricating oil additives as a result of gamma radiations. The nature and function of these additives were not disclosed pending the completion of an extensive test program.

Plastics

One particularly interesting demonstration was made using a radioactive cobalt pipe to speed chemical reactions and to transform certain materials. The cobalt pipe had been exposed to intense gamma radiations for over two years by placing it in a nuclear reactor. In the demonstration, the pipe and a quantity of liquid methyl methacrylate were placed in a shielded room. After an hour of exposure, the methyl methacrylate was transformed into a solid transparent plastic which can be used as a substitute for glass. Furthermore, the plastic was not radioactive.

Other Uses

Other uses for gamma radiation have turned up in the chemical and rubber industries. For example, the vulcanization of rubber can be achieved by exposure to gamma radiation. A long list of substances have been subjected to gamma radiation with amazing results. After exposure some materials exhibit such characteristics as greater pliability, better resistance to higher temperatures, greater strength, more rigidity, and improved transparency.

Although these discoveries are revolutionary many questions remain to be answered including an explanation of the mechanism of gamma radiation in the described processes. Intensive development work is underway and one can expect that some of these discoveries will find their way into the production scheme in the near future.



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★ You won't have any messy, time-consuming re-inking of pens on the new Bailey Recorders. The entire system is white-glove clean—hermetically sealed, non-evaporating, non-corrosive. Gone is any chance of sludge or oxide formation. Gone are clogged pens, interrupted records, unsightly splashes.

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PRESSURE
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FLOW · LEVEL
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the Miracle on

On the banks of the Ohio, right now, these two huge electric plants are turning out power at the rate of over 18-billion kilowatt-hours annually. They are, respectively, the first and second largest investor-owned power plants in the world.

They stand on what was farmland less than three and one-half years ago.

Their completion, substantially ahead of schedule, is the result of the outstanding teamwork of management, investors, engineers, technicians and workers in privately-owned utilities and their suppliers.

The vast power output of these plants, *almost half as much electricity as all France produces*, is ready to assure uninterrupted operation of the Atomic Energy Commission's uranium diffusion center near Portsmouth, Ohio.

When the AEC made its enormous needs known, 15 private electric companies* joined forces to form the Ohio Valley Electric Corporation and its subsidiary, Indiana-Kentucky Electric Corporation. Pooling their resources in men, money and experience, they and their suppliers worked faster than the construction timetable. In quick order the 11 gigantic B&W boilers, the turbines, generators, buildings—and all the vast complex of auxiliary equipment—were designed, built and placed into operation.

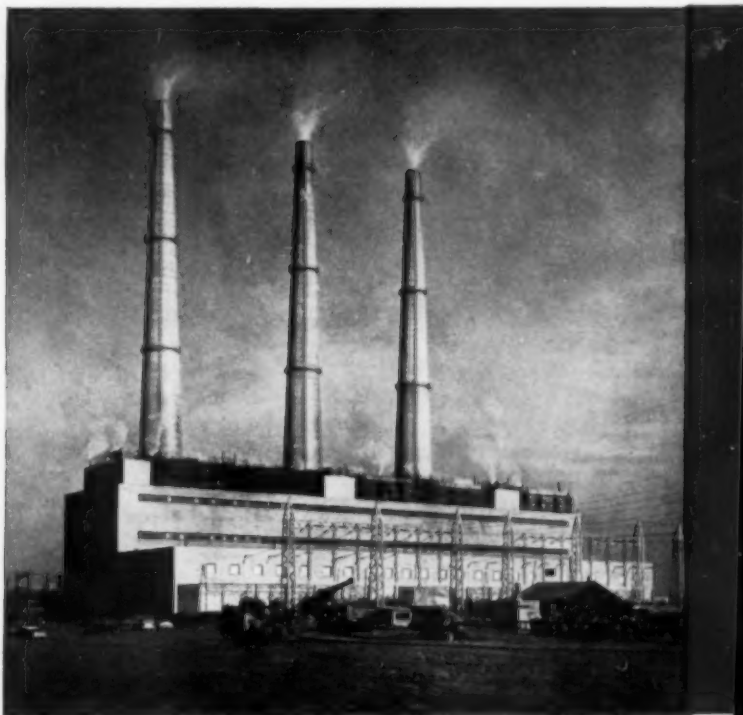
The first generating units were placed in commercial operation in February 1955. The final unit went on the line in February 1956 at Clifty Creek, marking the largest installation of power in a single project ever made in a twelve-month period.

All Americans can be proud of OVEC-IKEC for this great accomplishment. What appears to be a miracle, in reality is, a clear demonstration of what private enterprise and enlightened government, working together, can accomplish for the benefit of the entire nation.

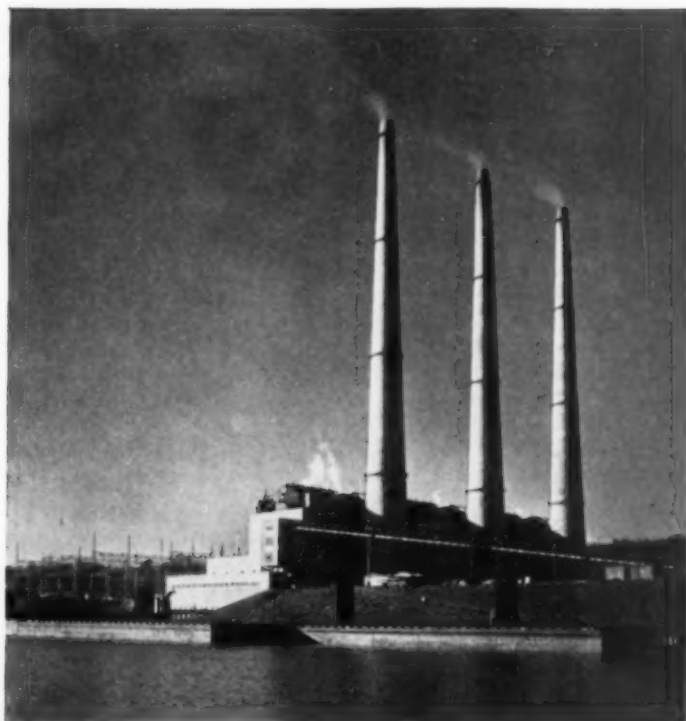
The future will undoubtedly pose many similar challenges. Can they be met? Are enough young engineers, business men, technicians, and skilled workers being developed to accept these great responsibilities? Babcock & Wilcox, like so many other American firms, is pledging its resources to guarantee that the answer will be "Yes!" Recruiting and training young men, expanding and modernizing production facilities, conducting extensive research and engineering development projects—all are part of a long range B&W program to contribute its share to the technical and economic progress so necessary for the continued growth of the nation.

The Babcock & Wilcox Company, 161 East 42nd Street, New York 17, N. Y.

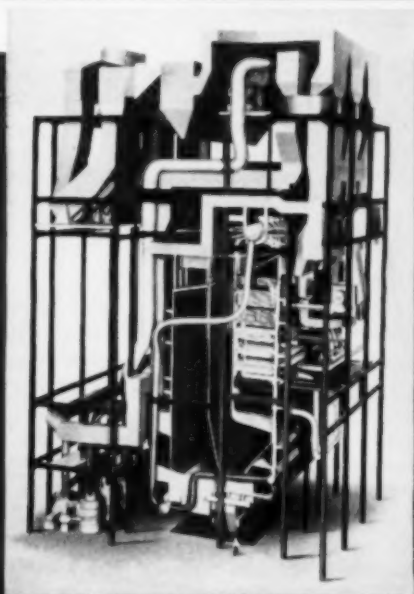
KYGER CREEK PLANT, at Cheshire, Ohio, with a capacity of 1,075,000 kilowatts, is the world's second largest investor-owned power plant.



the Ohio River



CLIFTY CREEK PLANT, at Madison, Indiana, with a capacity of 1,290,000 kilowatts, is the world's largest investor-owned power plant.



11 B&W Open-Pass Boilers generate steam for the two plants. Each boiler produces 1,330,000 lb of steam per hr at 2000 psi and 1050 F, with reheat to 1050 F. The utilization of high temperatures, high pressures and reheat at both plants places them among the most efficient and economical in operation.

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**Subsidiary of The West Penn Electric Co.

***Subsidiary of Ohio Edison Co.

BABCOCK & WILCOX



BOILER
DIVISION



HELPING the MAN-IN-THE-PLANT

Ideas... Methods... Gadgets

Make It Cooler Inside

WHITE PAINT on the roof of a temporary building, such as a construction office reduces the air conditioner load. Recent tests on a construction shack in the Gulf Coast area showed a difference of twenty to twenty-five degrees temperature (in the above-ceiling spaces) between a tar-paper type roof and a part of the same roof painted white. The difference in feel of offices under each half

of this roof was also noticeable. The tests were conducted with a paint designed for this purpose, but less expensive materials are undoubtedly effective enough to be worth using on a one season basis.

A roof that has exposed tar or gravel should be sealed with a sprayed-on coat of aluminum paint then painted with a weather-resistant, sun-fast white. Aluminum paint by itself, or paints that darken rapidly with age lose their effectiveness in a very short time.

In an area where it rains frequently the painted roof will be practically self cleaning. In dryer climates they can be washed off once in a while with a hose.

By R. G. STAPP
Arabi, Louisiana

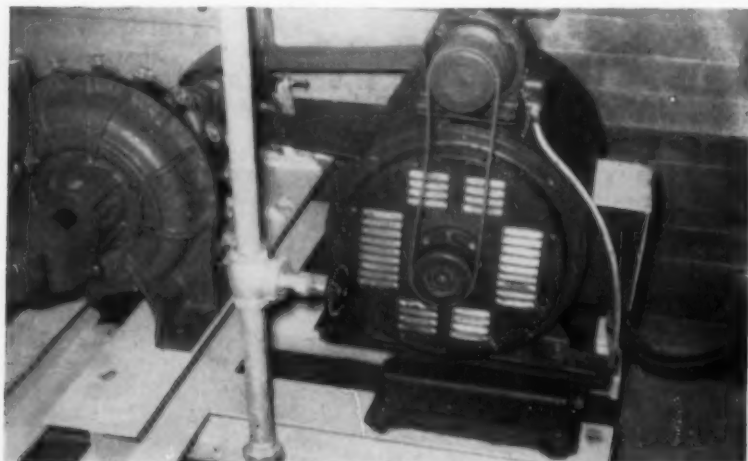
Individual Drives

PLANS FOR general modernization of plant equipment and operations at one Southern textile finishing plant included the replacement of the line shaft drives for the Nappers by individual drives.

Two machines were equipped experimentally with factory designed drives. Each drive consisted of a 230 rpm output gearmotor and a 6-groove C-section V-belt drive reducing from the 230 rpm to 75 rpm, the driven sheave being a non-standard 29" dia. sheave.

Operation of this arrangement proved to be quite satisfactory, and led to the decision to equip the remaining Nappers with individual drives. The plant engineers did not like the use of V-belts at such comparatively low speed, however, and decided to assemble their own drives instead of using the "packaged" job.

The new drives were designed to take advantage of inherent V-belt characteristics, by using a 1750 rpm motor, 5-groove B-section stock sheaves, and a shaft-mounted speed reducer. The 7½ hp motors are the self-cleaning or textile type, with high starting torque. The shaft mounted speed reducers (15 to 1 ratio) are standard in all respects; they are mounted without overload releases, as it was found these would kick-out at



Generator Mounted on Tension Control Base

THE SUPREME Rice Mill of Crowley, La. has a drive for a generator which has been in operation for two seasons and is giving very satisfactory service. It consists of a steam turbine, 141 hp, 3600 rpm which pulls a 50 kw generator at 1800 rpm by a two-ply Royal Chrome leather belt 8 inches wide. The distance between

centers is 40 inches. In this case the generator, or driven machine, is mounted on the tension control base because turbines are not readily adaptable to tension base mountings.

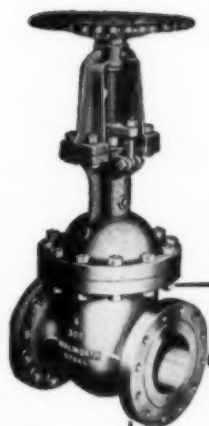
The driving pulley on the turbine is 8 inches in diameter with 9 inch face and the driven pulley 16 inches with 9 inch face. The power take-off on the turbine is equipped with a Falk spring grid coupling and two SKF ball bearing pillow blocks.

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Cast Steel Gate Valves

Series 150 and 300

Wedge Gate — Outside Screw and Yoke



Big 8-Point Superiority!



Sectional view of Series 300

Gland clearances are such that stem cannot be scored if gland should be tightened unevenly.

Deep Stuffing Boxes in all sizes (2" to 24") insure tightness and maximum packing life — costly leaks are eliminated.

Bonnets and Bodies are engineered to withstand pressure and minimize distortion — they're tough, durable, dependable.

Heavy Steel Walls provide extra strength and longer life.

Integral Body Guide Rib Faces are machined to insure accurate disc seating.

Seat Rings are bottom seated — not flange type. No recess exists at back of ring — hence no turbulence, erosion, or pressure drop.

Streamlined Ports allow high velocity, non-turbulent flow, and reduce the possibility of erosion.

Valves regularly have flanged ends. They can be supplied with ends for butt welding. Roller bearing yokes are available. On valves 5 inches and larger, by-passes can be furnished.

For Series 600 and higher, we recommend Walworth Pressure-Seal Steel Gate Valves.

For further information on Walworth Cast Steel Gate Valves, see your local Walworth distributor, or write:

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SOUTHERN POWER & INDUSTRY for MARCH, 1956

Ideas . . Methods . . Gadgets (Continued)

start-up because of the high torque of the motors.

Total cost of the assembled drive, including installation, was considerably less than that of the equipment alone on the packaged drives first installed. Operation over a period of several months has been completely satisfactory and trouble free.

Recently manufacturers are offering an almost identical drive in newest models, incorporating the same fundamentals of a high torque motor, mounting the speed reducer without overload release, and use of a V-belt drive operating at high, rather than low, belt speed.

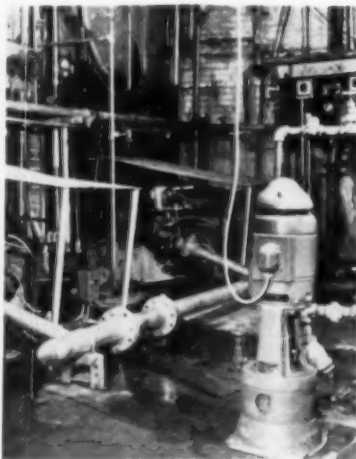
Modern Feed Pump & Magnetic Controls

A HORIZONTAL tubular boiler supplies constant steam for process heating with the help of a modern Deming pump at the Fairmont Foods Company plant, Lawton, Oklahoma.

The HRT boiler has been operating at the food packing plant for many years. Last September the firm installed a Deming 4-stage centrifugal high-pressure pump for boiler feed. The pump forces cold water from an open tank into the boiler at over 100 psi pressure. The pump handles water up to 250 F and is equipped with a bronze impeller and stainless steel shaft—standard on Deming 4-stage boiler feed pumps.

A magnetic float switch on the boiler water column controls the pump operation as water level changes in the boiler. The same switch shuts off the burner when water level drops dangerously low.

The boiler has operated unattended since the Deming pump and controls were installed. Chief Engineer F. J. Mallon regards the new system as very necessary to lengthen the life of the old boiler. Mallon selected a vertical pump to save floor space and to increase

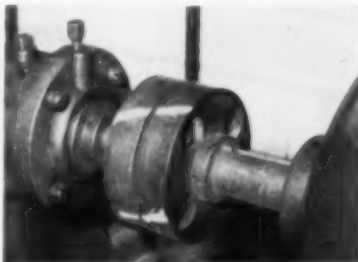


This HRT boiler operates unattended at the Fairmont Foods Co. plant, Lawton, Oklahoma, with the aid of a Deming high-pressure boiler feed pump (right) and magnetic controls that control water level.

motor and pump life by evenly supported thrust.

On-Off Indicator

AN INEXPENSIVE motor indicator to show running and stopped operation from some distance away is provided by a few well placed yellow paint stripes on



the coupling. When the motor is running the stripes are not visible being absorbed in the coupling centrifugal motion. Photos show the off-and-on appearance. The paint markings also facilitate correct coupling assembly at all times.

By L. W. FITZPATRICK
Jefferson City, Mo.

Versatile Welding Unit

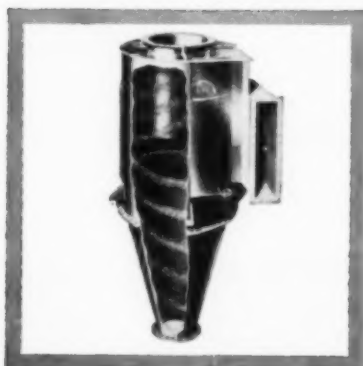
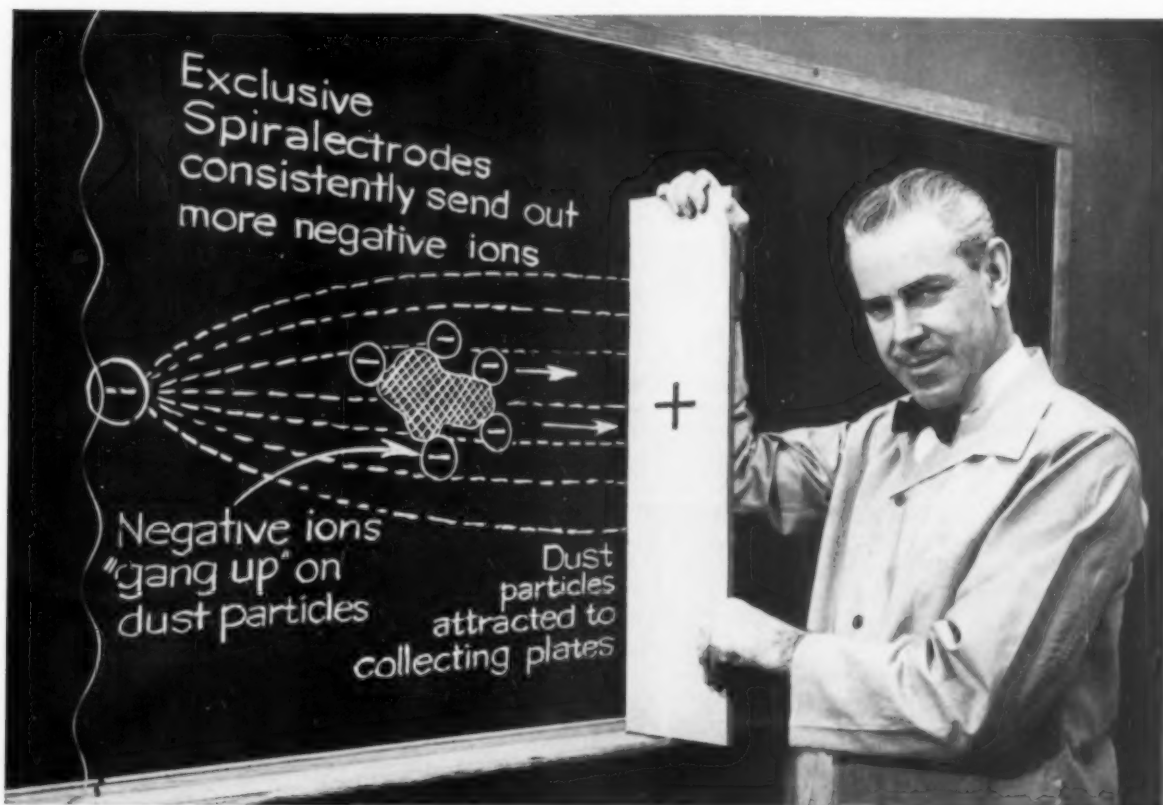
A MANIFOLD built into an acetylene welding tank rack and connected with compressed air permits use of the welding torch with air and acetylene instead of oxygen to provide a flame that is cool enough to weld white metal. This metal flows at about 700 degrees (much below the lowest temperature of an oxygen-acetylene flame), so the air-acetylene mixture makes welding of so-called "pot metal" much easier.



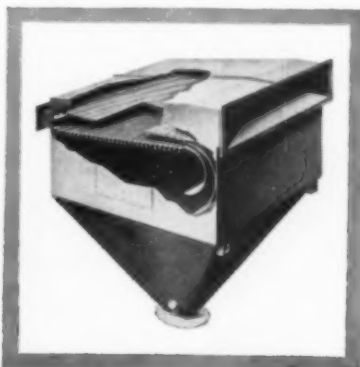
Either type of flame can be had by turning the proper valves. Another advantage of this manifold built by a shop owner in Fulton, Mo., is that a welding torch can be connected at one end and a cutting torch at the other, saving time by having both torches ready

By L. H. HOUCK
Jefferson City, Mo.

How a Buell Collection System "gangs-up" on dust to meet the toughest air pollution codes



Buell Cyclones also deliver extra collection efficiency to "gang-up" on dust: Exclusive Shave-off design harnesses double-eddy current and puts it to work.



Buell's Low Resistance Fly Ash Collector combines high efficiency to meet present day strictness, with low draft loss for natural or mechanical draft installations.



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Infinite Variable Speed with All-Hydraulic Overhead Crane

C-1

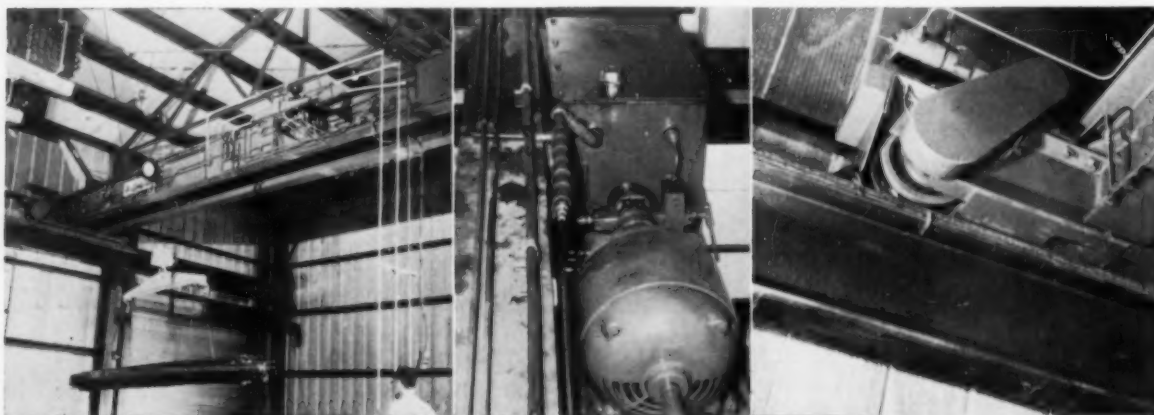
A completely hydraulic, three-ton overhead traveling crane has been designed and constructed as an experimental model by the **Shaw-Box Crane & Hoist Division** of Manning, Maxwell & Moore, Inc., Muskegon, Michigan. This crane has been operating for several months in a

local plant requiring average industrial crane service. While this crane is controlled from the floor, it may be equipped with the usual operator's cage.

Apparent advantages of this new all-hydraulic crane are that it provides infinite variable speed under any load, requires far less maintenance than its multi-motored electric counterpart because the use of hydraulics has eliminated many of the expensive parts and complicated

mechanisms necessary in an all electric overhead crane. It is estimated that the cost of the all-hydraulic crane will be approximately 10% less than comparable three-motored cranes.

Shaw-Box Division engineers have designs completed for cranes up to and including 10-ton capacity, which range covers between 65% and 70% of the cranes purchased. Whether or not designs will be developed for cranes over 10-tons



FIRST ALL-HYDRAULIC overhead crane to be constructed spans 37 ft and has a capacity of 3 tons. Pendulum controls on the right operate hydraulic valves which control bridge, trolley and hoist.

A 10 hp single speed squirrel-cage electric motor (center photo) drives a Dudco constant delivery, vane-type hydraulic pump to provide all power requirements.

This 1 1/4 hp Dudco vane-type hydraulic motor (right photo) is one of two used to power the bridge. Motors are flange mounted to gear reducers which are connected to the bridge drive wheels by roller chain.

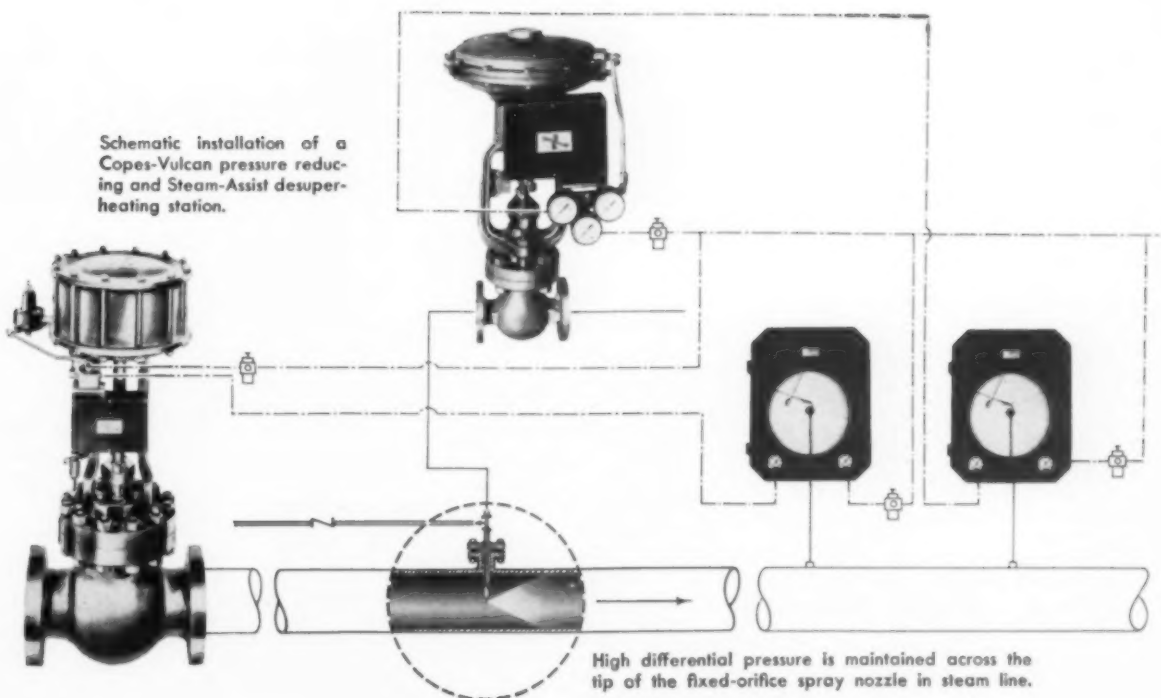
For More Free Data **CIRCLE CODE NO.** on the Handy Return Card — Page 17



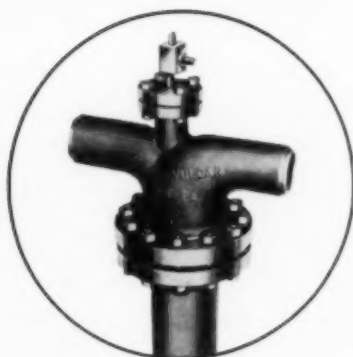
TROLLEY RIDES two rails mounted inside bridge girder web. It is moved by two link chains running the full inside length of both bridge girders. Hydraulic motor on the left (center photo) is used to power the trolley. It is flange mounted to a gear reducer which is connected by roller chain to the trolley.

Hoist mechanism is mounted on top of bridge girders (right photo).

It is made up of cylinder, piston and rod with four foot stroke. Movable crosshead (foreground) has six sheaves; stationary crosshead has six. As movable crosshead is extended by hydraulic cylinder, reverse ratio of six to one is obtained.



NEW Copes-Vulcan Pressure Reducing and Desuperheating Stations



Carburetor-type desuperheaters available with both Steam-Assist and straight mechanical-atomizing systems.

These high-quality pressure reducing and desuperheating stations offer the latest advances in reducing valves and desuperheaters. They give you an integrated station designed specifically to meet your operating needs.

Copes-Vulcan valves—diaphragm or piston operated, depending on your conditions—give close modulating control. Simplified design means optimum operating characteristics with easy, low-cost maintenance.

The Steam-Assist Desuperheater advances a new principle in reducing steam temperatures. Cooling water and assisting steam are mixed in the exclusive swirl chamber, upstream from the point of injection. No large steam bubbles form to cause hammer or vibration. Flow of assisting steam can be automatically reduced as load increases, and shut off completely at high loads where no more than mechanical atomization is needed.

"Packaged" control systems by Copes-Vulcan mean undivided responsibility, custom design and lifetime engineering service. They assure top performance over an unusually long service life.

COPEs-VULCAN DIVISION
BLAW-KNOX COMPANY

Erie 4, Pennsylvania



Equipment, Supplies & Methods (Continued)

capacity is dependent upon the reception of the all-hydraulic crane by industry.

The over-all efficiency of this new all-hydraulic overhead crane compares favorably with that of a modern three-motor electric traveling crane.

Though the full load speeds of this 3-ton capacity crane are 175 fpm for the bridge, 100 fpm for the trolley, and 18 fpm for the hoist, any desired speed to suit individual requirements may be easily obtained.

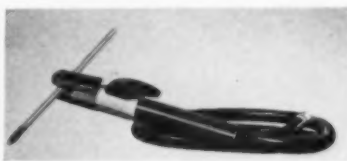
By the use of hydraulics throughout on this new crane much crane dead weight is eliminated because the following mechanical and electrical components always found on a multi-motored crane are eliminated: (1) cross shaft, (2) cross shaft bearings, (3) cross shaft bearings support brackets, (4) bridge brake (either mechanically, hydraulically, or solenoid operated), (5) the three wound rotor motors to power the hoist, trolley and bridge, vs. one squirrel-cage motor, (6) three electric controllers vs. a simple line starter for the squirrel-cage motor, (7) three banks of resistance, (8) all bridge cross wires, (9) all cur-

rent collectors for these cross wires, (10) hoist limit switch, (11) hoist solenoid brake, (12) hoist load brake or equivalent electrical control equipment, contactors, etc., etc., (13) rope winding drum, (14) all hoist gearing, (15) the large and heavy trolley frame which is required to carry the usual hoist and traversing machinery.

Cutting and Gouging Torch

C-3

Featuring new, impact-resistant moulded jaw insulators, and a new silicone glass laminate sleeve to protect the upper end of the handle from the heat, new torch of the **Arcair Company**, 423 S. Mt. Pleasant St., Lancaster, Ohio, will take up to $\frac{1}{2}$ " diameter electrodes, and will deliver almost twice as much air as the previous model.



New Model G-5 torch is especially designed for heavy duty work and longer service life. It operates from an ordinary d-c welding machine and a compressed air line. This model also features a rotating nozzle

that permits changing electrode angle to suit the job, but always maintains air jet in perfect alignment. Air and current are brought to the torch through a concentric cable, permitting great flexibility and ease of handling. Depth of cut and amount of metal removed can be closely controlled by the operator.

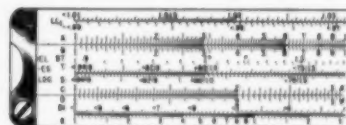
The Arcair process is the economical way to remove defects in castings, or forgings and clean the roots of welds and remove welds — as well as grooving, beveling, gouging or cutting mild steel, stainless steel, hard alloys, brass, bronze, monel and cast iron. The Arcair torch is much faster than chipping or grinding, and cheaper to operate than oxygen equipment. Grooves left by the torch are clean and ready to weld without further preparation.

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Green-Yellow Slide Rule

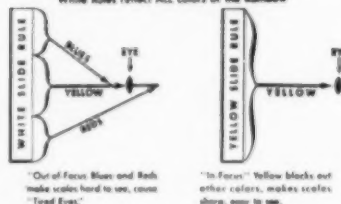
C-4

New light-alloy slide rules by **Pickett & Eckel, Inc.**, 1109 S. Fremont, Alhambra, Calif., are made in green-yellow, eliminating violet and red rays which focus in front of and behind retina.

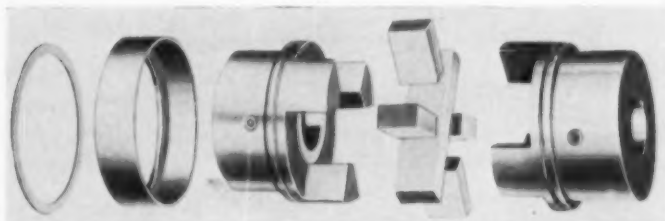


Green-yellow shade coincides with optimum sight point of the spectrum, cuts eyestrain, blurring and errors in reading calibrations.

**ONLY EYE-SAVER YELLOW SLIDE RULES
FOCUS SCALES DIRECTLY ON THE EYE**
White Rules reflect ALL colors of the Rainbow



Non-corrosive, non-rusting metal construction eliminates warping, swelling and binding. Now made in 6" and 10" Trig, Log-Log standard rules, or in rules made to special order.



Flexible Coupling Design

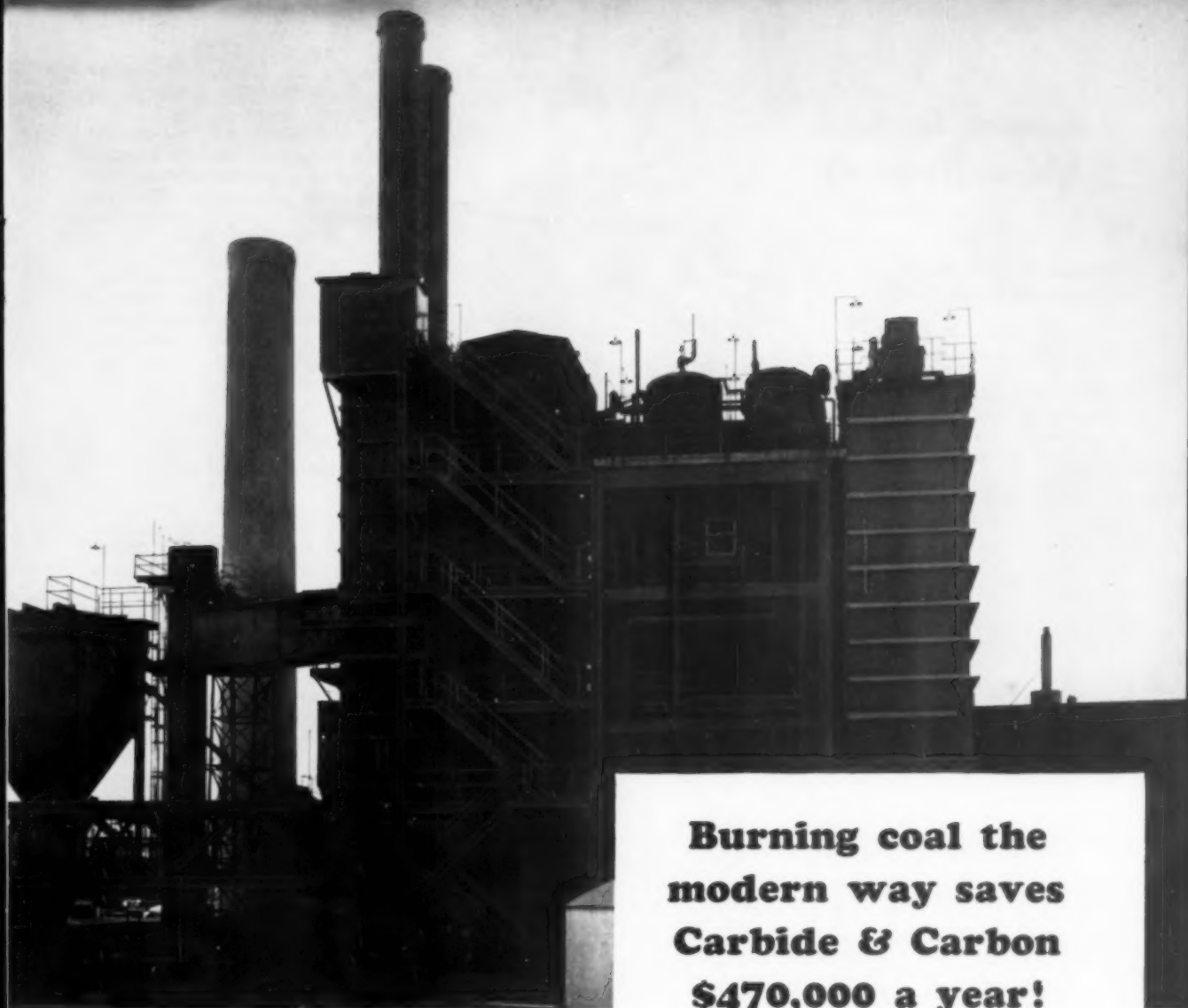
C-2

A new radially removable flexible coupling that provides extremely easy assembly and disassembly is now being manufactured by **Lovejoy Flexible Coupling Co.**, 4811 W. Lake St., Chicago, Ill. The unit is lubrication-free and is especially suited to centrifugal and impeller pumps and other installations where radial removability is required.

Six sizes are available, ranging from 2.58 to 29.6 hp at 100 rpm. All feature reversible cushions so that

the cushions can be reversed on unidirectional loads to double their service life.

The radial removability is accomplished by special cushions cut so they are held in position by a standard Type "C" collar when the coupling is assembled. When the collar is removed the cushions can be easily removed. This allows the coupling half and connected shaft to be rotated so that the intermeshing jaws slide into the stationary coupling half which is not removed. Disassembly is similarly accomplished.



Burning coal the modern way saves Carbide & Carbon \$470,000 a year!

Consult an engineering firm

Designing and building hundreds of heating and power installations a year, qualified engineering firms can bring you the latest knowledge of fuel costs and equipment. If you are planning the construction of new heating or power facilities—or the remodeling of an existing installation—one of these concerns will work closely with your own engineering department to effect substantial savings not only in efficiency but in fuel economy over the years.

facts you should know about coal

In most industrial areas, bituminous coal is the lowest-cost fuel available • Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar • Automatic coal and ash handling systems can cut your labor cost to a minimum. Coal is the safest fuel to store and use • No smoke or dust problems when coal is burned with modern equipment • Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

Two years ago Carbide & Carbon Chemicals Co. instituted a modernization program in the power department of its South Charleston, W. Va. plant. Utilizing latest steam-generating techniques and equipment, the firm replaced an outmoded installation with a 289,000-lb.-per-hr. boiler fired with pulverized coal, and completely revamped the rest of its power system.

Today, this program has resulted in impressive annual savings. Lower fuel and maintenance costs save \$85,000 . . . increased efficiency, \$175,000 . . . flyash re-use, \$10,000 . . . lower electrical power generation costs, \$150,000 . . . lower manpower costs, \$50,000—a total savings of \$470,000 a year *plus* continuing power service dependability at Carbide & Carbon.

For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

NATIONAL COAL ASSOCIATION
Southern Building, Washington, 5, D. C.

Equipment, Supplies & Methods (Continued)

Improved Lightweight Aluminum Power Drive

C-5 Model - D Power Drive gears of **Beaver Pipe Tools, Inc.**, Warren, Ohio are now fully enclosed and lubricated for the life of the machine. The power grip wrenchless chuck works in both forward and reverse and holds like a "bulldog."

The motor of the redesigned Model D is easily accessible without dis-

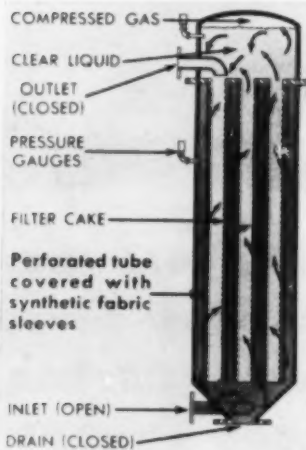


mantling the machine. The operating switch is protected against damage

from oil and weather. The motor is well-ventilated for greater power and lower upkeep.

A four-legged job, the Beaver Model D stays put when in operation . . . an important factor when using drive shaft and geared tools. The powerful motor drives geared tools up to 12 in.

The user has his choice of a 110 or 220 volt universal motor. When used with the new Beaver No. 78 Threader and 102PD Cutter the user has an exceptional, time-saving, money-making outfit. Entire unit weighs only 98 lb.



Self-Cleaning Filter

C-6 The Hydra-Shoc filter, manufactured by **Industrial Filter and Pump Mfg. Co.**, 5916 Ogden Ave., Chicago 50, Ill., is a tubular filter useful for any water or chemical purification task. It uses sudden pressure drop for extremely fast cleaning.

It builds up air pressure at the end of the filtering cycle and uses the pressure for a sudden back-surge to clean the filter. No extra devices are used, the filter shell itself acts as the pressure chamber and the arrangement of regular valving provides the controls. The Hydra-Shoc eliminates the use of filtered water for cleaning and the need for back flow pumps. Operating vertically, it takes very little floor space.

The Hydra-Shoc follows the usual operation pattern for tubular filters. The influent passes through the walls of perforated tubes covered with synthetic fabrics. Pre-coating, when needed, is done in the usual way.

The cleaning procedure is extremely simple. The outlet valve is closed, building up pressure on the entrapped air, then a pair of quick opening valves simultaneously shut off the inlet and open the drain. The compressed air instantly causes a violent back-surge that expands the tube covers, dislodges the filter cake and forces it out the drain in a matter of seconds.

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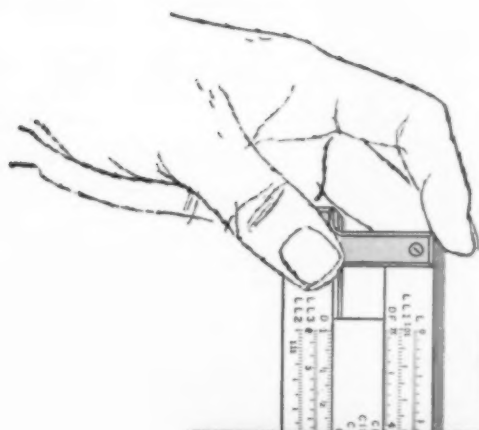
Cementable Teflon Tape

C-7 Teflon Tape, treated for cementing with any commercial adhesive (including pressure-sensitive adhesives), to metal, glass, wood, plastics or any other surface, is being produced by **The United States Gasket Co.**, Camden 1, New Jersey.

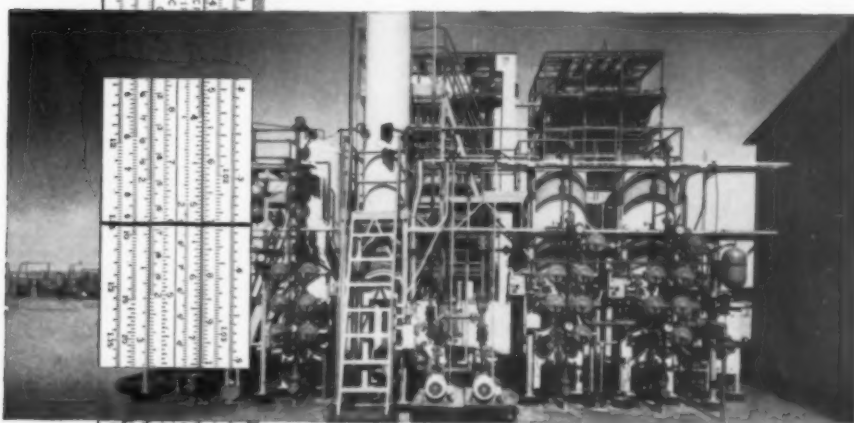


Applications of this material can be made for many purposes where Teflon's extremely anti-hesive sanitary surface, zero water absorption, chemical inertness, broad service temperature range and unusual dielectric qualities are desired: frictionless facings for conveyor and packaging machine guide rails; easy to clean work surfaces; frictionless linings for hoppers and tanks to assure uniform feed without sticking; chemically inert coverings for metal and other surfaces coming in contact with corrosive substances; insulating electric motor windings and electronic coils, panels, chassis areas, cases, etc., for high temperature, high voltage, high frequency services.

Cementable Teflon Tape, 5 mil. to 60 mil. in thickness, is available in continuous rolls up to 12-in. wide. Sheets are also available in 1/32-in. thickness in sizes up to 24 x 24 in. and in 1/16-in. thickness, up to 48 x 48 in.



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FOR ...
DEPENDABILITY**



GRAVER

DEMINERALIZERS

**FOR
BOILER
FEEDWATER
TREATMENT**

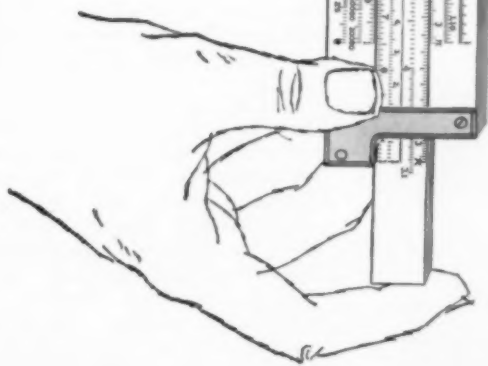
Write for Demineralizer Bulletin WC-111

Industrial Department: I-111

GRAVER WATER CONDITIONING CO.

A Division of Graver Tank & Mfg. Co., Inc.

216 West 14th Street, New York 11, N. Y.



Equipment, Supplies & Methods (Continued)

All-Air Tube Expander Control

C-8 A new tube expander drive called the Torq-Air-Matic, incorporating three "firsts" has been developed by **Thomas C. Wilson, Inc.**, 21-11 44th Ave., Long Island City, New York.

It is an all-air driven tube expander drive, offering a control entirely free from the effect of operating variables and maintenance problems, and providing a control with torque output calibrated in terms of foot-pounds instead of arbitrary units of measurement.

Measuring devices on conventional expander controls measure input-output ratio only. The Torq-Air-Matic method of registering torque at the output spindle prevents tubes from being over-rolled or under-



rolled. The readings are precise and consistent regardless of tube sheet hole variations. This control feature also eliminates overstressing of tube sheets, reduces warpage and ligament "push-over." Tube bowing is held to absolute minimum which increases the efficiency of heat exchange units. Tube life is increased and operator fatigue is minimized.

The Torq-Air-Matic is an all-air rotating type control. It will produce

14 foot-pounds torque at 90 psi with maximum consumption of 12 cfm of air. It is completely self-contained, which eliminates the need of separate control cabinets, cables and other connections. The only connection required is the operating air hose.

Midget Chain Hoist

C-10 An 11 lb Midget Chain Hoist capable of lifting 250 lb, developed by **Cotting Hoist Division** of Duff-Norton Company, Danville, Ill., is a small, fast and safe hoist. It has a standard lift of 7 ft and a minimum distance of 9 in. between hooks. Extra chain is available for greater lifts.

One man can easily lift a load 30 ft in one minute with the midget hoist, which can be used in a wide variety of fields, from production applications handling small items to plant maintenance.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 17

Iron Powder Type Maintenance Electrode

C-9 The first iron powder type electrode especially for maintenance and repair welding was recently introduced by the **Lincoln Electric Co.**, Cleveland 17, Ohio.

The new electrode, Jet-Hard BU-90, is for fast build-up of worn parts at low cost. It produces a medium

carbon, medium alloy deposit for building up worn parts with a dense, moderately hard, tough machinable surface to resist shock and abrasion.

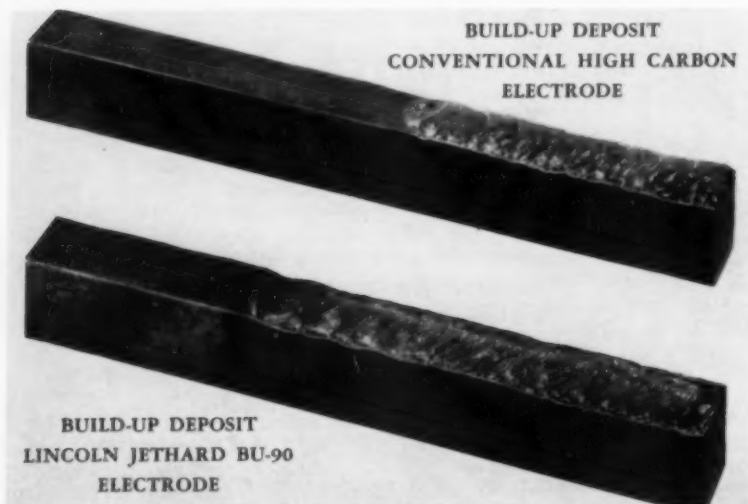
It has the excellent operating properties of the Lincoln iron powder type, Jetweld, electrodes. Its high deposition rate results in a 35% to 45% increase in the amount of metal deposited per minute, compared with conventional build-up electrodes. This is an important cost-reducing

factor in build-up applications where large amounts of metal are deposited. Slag is practically self-removing. The arc is smooth with minimum spatter and is easy to control.

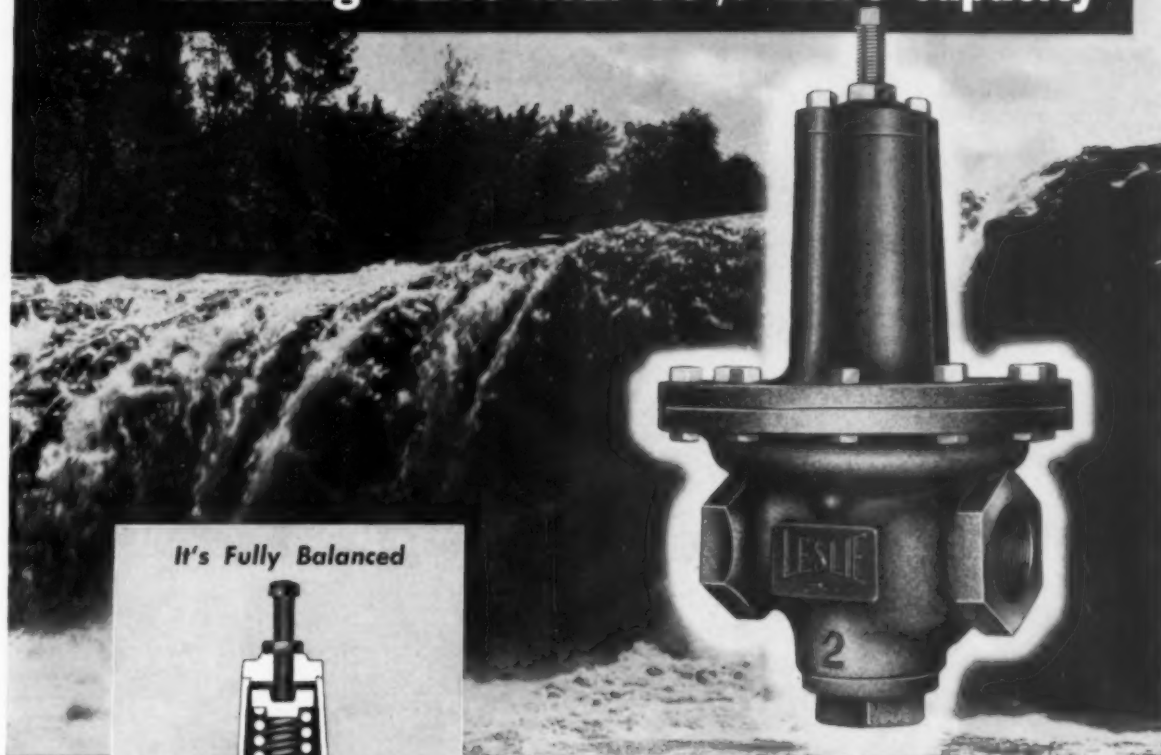
Chromium carbide in the deposit produces abrasion resistance 25% to 50% greater than that of deposits made with conventional high carbon build-up electrodes. Impact resistance and toughness is increased by both chromium and manganese in the deposit. The hardness range for BU-90 runs from 27 to 40 Rockwell C under normal welding conditions. Exact values depend upon the alloy content of the steel welded and the cooling rate of the weld. Deposits made with normal procedures are machinable with high speed or carbide tools. Hardness can be increased by water quenching the deposit from 1600 F.

It is for operation on either d-c, electrode negative or a-c; available in 5/32", 3/16" and 1/4" sizes. Typical applications are building up shafts, trunnions, crane and mine car wheels, tractor grousers, rolls and idlers, shovel tracks, sprockets and gears. Prior to depositing a finish pass of hard-facing material, it is excellent for building up to size, worn bucket lips, pumps and impeller housings, scraper blades, pulverizer plows, mill and crusher hammers.

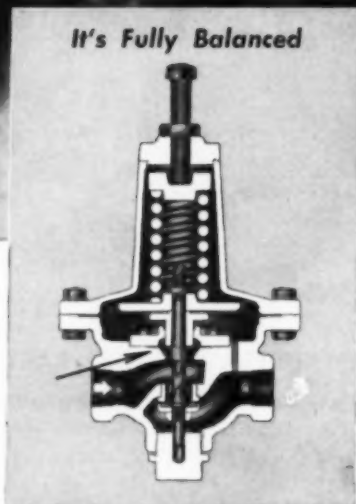
Identical beads show Jet-Hard BU-90 deposits 35% to 40% more pounds per minute of build-up than conventional high carbon electrodes.



Here is the new LESLIE "HI-FLO" Water Reducing Valve with 50% more capacity



It's Fully Balanced



Unique construction of "Hi-Flo" Reducing Valve. Note the small lower diaphragm that provides fully balanced, floating action.

HERE IS THE ALL NEW Leslie Reducing Valve with *capacity-regulation* features that have never been offered before. Here is a regulator with 50 - 100% greater capacity by actual test.*

Here's the unbeatable combination of design features:

"HI-FLO" — Large bowl construction; long stroke diaphragm gives full flow of water and other non-corrosive liquids.

FULLY BALANCED — The main valve, fully balanced by lower diaphragm, virtually floats to provide smooth, friction-free, throttling action.

DROP-TIGHT SHUTOFF — Resilient seating disc provides tight closure under all conditions.

TROUBLE-FREE DESIGN — Chatter and hammer eliminated; no piston cups or seals to clog or change. Corrosion resistant trim with renewable interchangeable fit.

Ask your Leslie Engineer to show you how the exclusive Leslie "Hi-Flo" valve can be used to your advantage in water reducing stations, fuel oil pressure control, process lines, etc. He's in your classified directory under "Valves" or "Regulators".

***Write today for Bulletin 553 for graphic performance comparison and complete capacity data.**



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LESLIE CO., 261 GRANT AVENUE, LYNDHURST, NEW JERSEY

CONTROLLED QUALITY MEANS QUALITY CONTROLS

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SOUTHERN POWER & INDUSTRY for MARCH, 1956

Want control for Water Heaters, Heat Exchangers, Processes?

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FLOWRITE

One of Powers
Premium Quality
Diaphragm
Control Valves.
They're simple,
sturdy and
dependable.

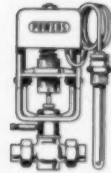


Over 60 Years of
Temperature and
Humidity Control



(c28)

You Will Insure Better Temperature Control IF—



you use the right type regulator and proper size control valve. Whether a simple self-operating regulator shown at left is required or the air operated controls featured here . . . you can get both types and others from Powers. For further information call or write our nearest office.

Powers ACCRITEM Temperature Regulator and FLOWRITE Valve—the right combination for many control problems where pressure and load conditions fluctuate widely, also for control of large size valves.



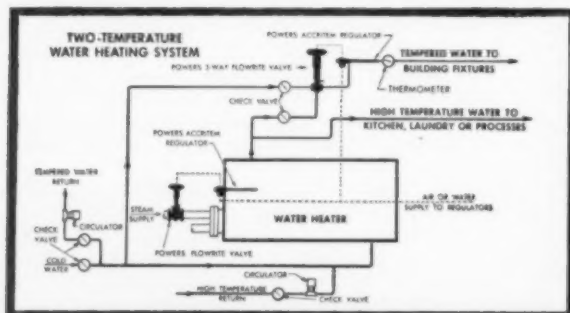
Over
50 Years
Experience
making this
type of
regulator

Control Point
easily changed

Air or water
operated

Ranges
50 to 250°F—150 to 350°F

VALVES: Available in a variety of body types and inner valves.

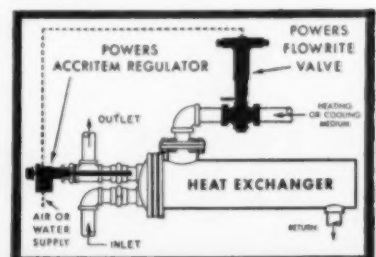
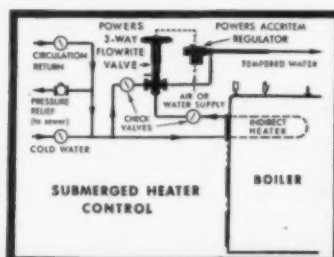
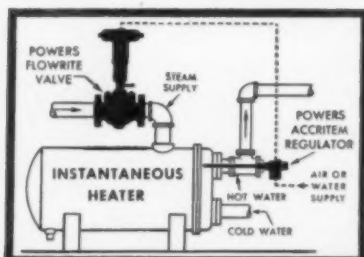


ACCRITEM TEMPERATURE REGULATOR

Gives Close Control and Years of Dependable Service.

- Has Adjustable Throttling Range and Calibrated Dial.
- Simple, Durable Construction assures years of trouble-free service.
- Easy to Install • Direct or Reverse Acting, reversible on the job.
- Small Size: Regulator head is 2 7/8" wide, 3 1/4" high, bulb is 1 1/2" long with 1/4" IPS Connection.

Fully Described in Bulletin 316. Write for a copy.



THE POWERS REGULATOR COMPANY

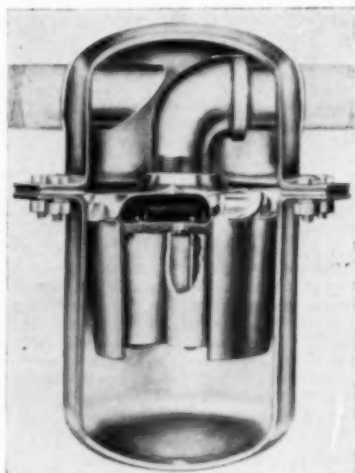
Skokie, Ill. • Offices in Chief Cities in U. S. A.
Also Canada and Mexico • See your phone book

1333 Spring St., Atlanta, Ga. — 101 N. Elm St., Greensboro, N. C.

Equipment, Supplies & Methods (Continued)

High Flow Filter

C-11 The new Model 3116 — 2" high-flow industrial filter, by **Arrow Tools, Inc.**, 1994 S. Kostner Ave., Chicago 23, Illinois, is designed for bulk handling of liquids, gases, diesel fuel, hydraulic fluids, gasoline, water, chemicals, oils, distillates and compressible fluids.

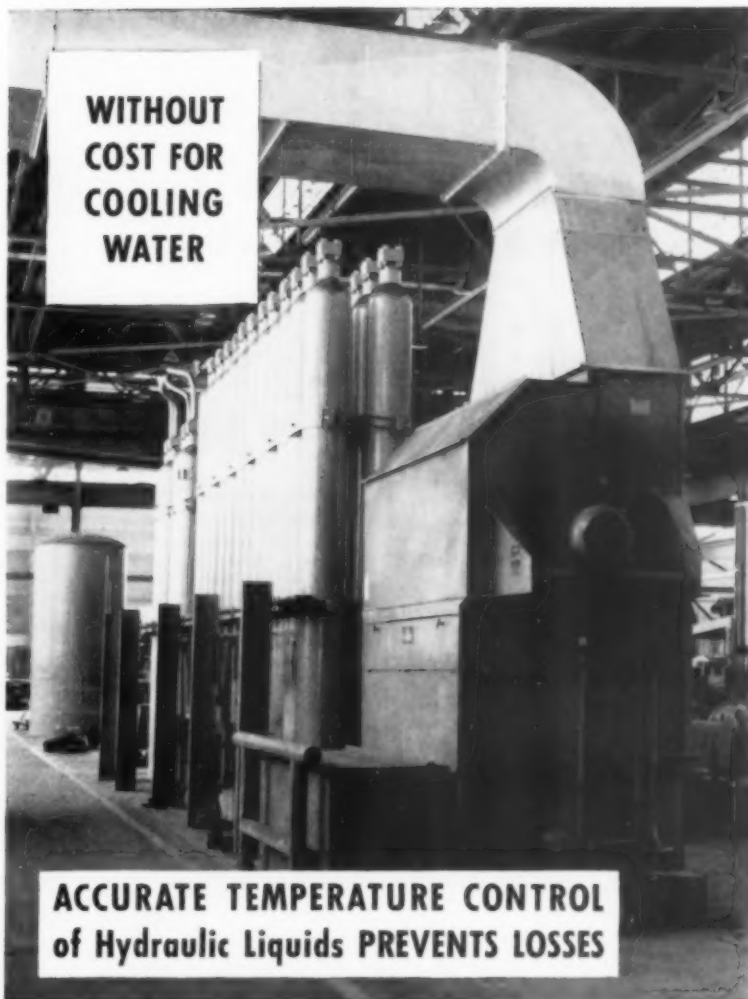


It provides efficient filtration with low-pressure drop. The permanent porous bronze, cleanable filter element filters out solids from 80 microns down to 6.5 microns.

Company engineers will submit filter specifications to meet particular requirements and requests inquirers to specify degree of filtration, type liquid or gas, flow required in gallons per minute, maximum operating pressure and pipe line diameter inlet and outlet.

**USE SPI
READER SERVICE**

**See Service Card
Pages 17-18**



**WITHOUT
COST FOR
COOLING
WATER**

**ACCURATE TEMPERATURE CONTROL
of Hydraulic Liquids PREVENTS LOSSES**

● This **NIAGARA AERO HEAT EXCHANGER** cools the liquid for a large hydraulic press, preventing heat damage to the pump stuffing boxes. Using outdoor air as the evaporative cooling medium, it removes the heat at the rate of input (1,875,000 BTU/hr.) with no cooling water consumption except a negligible amount evaporated.

Air is free and cheaper to move than water. You can save much expense in pumping, piping and power, and quickly recover the equipment cost from the water saving.

Similar Niagara machines cool water, oils, solutions, lubricants and coolants for many mechanical, electrical and chemical processes. You can cool quench baths, welding machines, plastic molds, furnaces, controlled atmospheres, gases, compressed air either for power or instruments or processes. In a closed system, your coolant is never contaminated. The system is simple and easy to keep up; the equipment has a long, useful life. Select from a wide range of sizes up to 30,000,000 BTU.

Write for Bulletin 120 to obtain a complete description.

NIAGARA BLOWER COMPANY

Dept. S. P., 405 Lexington Ave.

New York 17, N. Y.

Niagara District Engineers in Principal Cities of United States and Canada

Bulletin Board for Southern Industry

Products & Engineering Services of Leading Southern & Southwestern Manufacturers

O-1 Water Tube Boilers

Booklet—Describes details of stoker-oil or gas or combination gas/oil, 10 to 350 hp to 250 psi; designed for easy conversion to any fuel. — QUEEN CITY ENGINEERING COMPANY, INC., Box 3103, Charlotte, N. C.

O-2 Grating—Flooring

Catalog, 12 pages—Gives picture story of "Weldforged" steel grating, flooring and stair treads—continuous spiral cross bars, alternating right and left, and slightly above bearing bars, electronically weldforged into inseparable units to insure greater non-skid protection and durability. — KERRIGAN IRON WORKS, INC., 1033 Herman St., Nashville, Tenn.

O-3 Welding Stainless Steel

52 page Booklet contains valuable data on the welding, brazing, soldering and hot cutting of stainless steel.—WAREHOUSE DIVISION, ATLANTIC STEEL COMPANY, Box 1714, Atlanta, Ga.

O-4 Aluminum Pipe Jacketing

Folder J-25—Gives complete applications and instructions for the use of Childers jacketing for weather-proofing of insulated lines, towers, vessels and tanks. Illustrated with detailed drawings. —CHILDERS MFG. CO., Houston, Texas.

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O-5 Belt Conveyors

Catalog ID-481A—Describes Continental belt conveyors featuring standard and special idlers and many convenient accessories for application in materials handling.—CONTINENTAL GIN CO., Birmingham, Ala.

O-6 Water Conditioning

Brochure describes company's engineering services—zeolite water softeners, filters and purifiers, modernized and rebuilt water softeners, aerators and degasitors and process and boiler water conditioning. — SOUTHERN WATER CONDITIONING, INC., Jacksonville, Fla.

O-7 Metal Stamping Facilities

Brochure No. 100—Describes shearing, blanking, drawing, forming, embossing, assembly and finishing equipment in Campeco's modern Carolina plant which offers Southern industry convenient, modern facilities for metal stamping. Plant has 67 major units of equipment, including a 300 ton hydraulic press. From design through delivery, Campeco converts your production ideas into finished metal products.—CAROLINA METAL PRODUCTS, INC., Box 3636, Charlotte, N. C.

O-8 Gas-Operated Actuator for Remote Operations

Data sheets describe the Rototarm, a new self-contained gas-operated double-acting actuator for remote operations of plug valves and similar mechanisms. Only one gas-operating line is required to open and close. Easy field installation.—BET-TIS CORPORATION, 320 South 66th St., Houston, Texas.

O-9 Hot Spray Heater for Outdoor Maintenance

Data sheets describe the Spee-Flo Hot Spray Portable 600, a heavy duty field unit designed to operate in chemical plants, oil fields, refineries, shipyards, steel mills and wherever protective coatings are applied. Brings advantages of heated application into outdoor maintenance work for use with all types of sprayable coatings. — THE SPEE-FLO COMPANY, 720 Polk Avenue, Houston, Tex.

O-10 Industrial Process Equipment

20 page brochure describes company's contract manufacturing facilities for heat exchangers, pressure vessels and fabricated piping. Specialized fabrication facilities can meet requirements of processed oil and gas and other Southern industries.—McJUNKIN CORPORATION, 1352 Hansford Street, Charleston, West Virginia.

O-11 Centrifugal Pumps

8 page catalog CP 452 covers types D and E Streamline Flo centrifugal pumps for handling acids, alkalis, salts, abrasives and various other kinds and types of fluid under varied conditions. Design features are illustrated and emphasis



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FOR EVERY REQUIREMENT
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Describes and catalogs the more popular sizes of Brook a.c. motors—World's Most Respected Motor. Surpass NEMA specifications, yet cost less than ordinary motors. Single phase and polyphase. Available in Open Drip Proof or Splash Proof, Totally Enclosed Fan Cooled, Totally Enclosed Non-Ventilated, NEMA "C" Flange, Extended Shaft Pump Motors and other types—all built better to deliver power at minimum cost.

FAST DELIVERY OF ALL POPULAR MODELS

Brook Motors are available from warehouses at: Chicago; Miami, Fla.; Jersey City, N. J.; Houston; Dallas; Los Angeles; San Francisco; Seattle; Salt Lake City; Savannah, Ga.; and other major distributing points.



Consult Your Brook Motor field engineer.

BROOK MOTOR CORPORATION
3553-55 W. Peterson Ave., Chicago 45, Ill.

stressed on long life and easy maintenance. — MISSION MANUFACTURING CO., Box 4209, Houston, Texas.

O-12 Maintenance Record Systems

Data sheets show how Acme Visible Preventive Maintenance Record Systems cut "down" time. Shows how preventive maintenance can be accurately scheduled and accomplished. Visible signals show inspection schedules on a monthly basis. Colors designate types of work to be done. Other color signals indicate week within the month when inspection is to be made. — ACME VISIBLE RECORDS, INC., Crozet, Va.

O-13 Pneumatic Grinder

Data sheets describe the light weight pneumatic cup wheel Cleco 2000 grinder, one of the most powerful 6" grinders available. Weighs only 10½ lb without guard. Design permits operator to do a faster and easier job.—CLECO DIVISION, REED ROLLER BIT COMPANY, Houston, Texas.

O-14 Band Welder

Data sheet describes new tool for installing face wires and their retainer bands on cylindrical filter screens, washers and deckers. Tool welds face wire seam and also spot welds the two ends of the band together. Mechanism is enclosed in a two piece non-conducting fiberglass case, an important safety feature. Light weight unit greatly cuts joining time and makes use of heavy equipment such as an oxy-acetylene outfit or electric welding machine. — KRAFT EQUIPMENT COMPANY, INC., Southeastern Shipyards, Savannah, Ga.

O-15 Butterfly Valve Design

Data sheet describes new series of butterfly valves supplied with threaded bolt holes rather than the drilled holes normally supplied on valves designed for use between flanges. No gaskets required between flanges. Non-lubricated, self-cleaning valves designed for use on vacuum or pressure lines handling liquids, dry materials or slurries, etc. Available in steel or corrosion-resistant materials.—KEYSTONE TOOL CORP., Box 6716, Houston, Tex.

O-16 Scotch Marine Boiler

Bulletin 1054 describes the "W & D" one piece package boiler featuring quick installation, fast steaming, portability and low maintenance. Only five connections required. Bulletin gives all general specifications.—WILLIAMS & DAVIS BOILER & WELDING CO., INC., 2527 Canton St., Dallas, Tex.

O-17 Air Filtration

Bulletin 234 describes and illustrates the Auto-Airmat, which is the automatic dry-type air filter. Principle of operation, performance characteristics, construction and installation fully discussed.—AMERICAN AIR FILTER COMPANY, INC., 275 Central Ave., Louisville 8, Ky.

IF IT'S EXPOSED TO RUST—
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**HOT-DIP
GALVANIZED**
BY
DIXISTEEL
TRADE MARK

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Add years of useful life to iron or steel. Give your products new sales appeal. Genuine hot dip galvanizing will do it.

Our new facilities have greatly increased our capacity and made it possible to hot dip galvanize much larger items. You get a more uniform, cleaner job; fast service.

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FABRICATING DIVISION

Atlantic Steel Company

ATLANTA, GEORGIA • EMERSON 3441

Bulletin Board (Continued)

O-18 Chemical Injectors and Proportioning Pumps

Bulletins describe positive displacement, reciprocating type pumps for chemical injection, proportioning, pressure lubrication and fluid transfer. Will handle all types of aqueous solutions and liquid lubricants and will inject or proportion additives into lines or vessels carrying as much as 30,000 psi. — **TEXTTEAM CORPORATION**, Box 9127, Houston, Tex.

O-19 Elevated Steel Tanks

16 page booklet "Tank Talks" shows various types of elevated steel tanks constructed and erected by manufacturers as well as stand pipes, reservoirs, storage and high pressure vessels, cylinders, along with helpful technical data.—**R. D. COLE MANUFACTURING COMPANY**, Newnan, Ga.

O-20 Leather Belting

Booklet describes comprehensively the selection, installation, and proper maintenance of modern leather belting.—**ATLANTA BELTING CO.**, 508-510 Whitehall St., S. W., Atlanta, Ga.

O-21 Hot Water Storage Tanks and Heaters

Folder A. I. A. 29-D-2 describes the Reco horizontal and vertical copper-lined hot water storage tanks and heaters. Gives specifications and special construction details.—**RICHMOND ENGINEERING CO., INC.**, 7th & Hospital Streets, Richmond, Va.

O-22 Flex Ring Closure

Bulletin 3000 — Describes the Sillers "Flex Ring Closure" for faster access to the inside of pressure vessels or piping. Design features one bolt opening and closing, tighter seal at high pressures, and no seal destruction in case of fire. Applicable to boilers, evaporators, heat exchangers, filters, strainers, other pressure vessels and piping systems.—**SILLERS ENGINEERING COMPANY**, Box 13165, Dallas, Texas.

For More Free Data **CIRCLE CODE NO.**
on the Handy Return Card — Page 17

O-23 Non-Lubricated Plug Valve

Catalog No. 54-1-W—Describes how company's non-lubricated steel plug valve lifts, turns and reseats in one operation. Wrench - operated, handwheel - operated, and worm gear-operated designs available. Adaptable for remote control through use

of electric, air-motor, or air-cylinder operator.—**WEDGEPLUG VALUE COMPANY, INC.**, New Orleans 25, La.

O-24 Heavy Processing Equipment

Bulletin "Facilities and Products" — Describes special production techniques at Newport News for the fabrication of any type of pressure vessel and other heavy process equipment. — **NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY**, Newport News, Va.

O-25 Thread Compound

Brochure, "The Inside Dope on Big 'D' Dope"—Describes the 99% metallic lead all-purpose thread compound with silicones added. The compound is universally adaptable to water, oil, and chemical lines.—**C. H. DRAGERT COMPANY, INC.**, Box 5092-7, Dallas, Texas.

O-26 Metal Fabricating

General Metals Products Catalog — Describes mild steel, stainless steel, clad steel, aluminum and wrought iron fabricating facilities of the Boardman Company. The company fabricates pressure vessels, bins, conveyors, elevators, mixers, smokestacks, tanks, etc. — **THE BOARDMAN CO.**, Box 1152, Oklahoma City, Oklahoma.

O-27 Power Transmission Service

Catalog GCI01 — Describes company's complete line of drives, couplings, and pulleys, which utilize one simplified bushing system, making them more efficient, easier to install and to maintain. — **BROWNING MANUFACTURING COMPANY**, Maysville, Kentucky.

O-28 Watchmans Clock

Catalog — Describes how the Lathem 72-hour dial watchman's clock gives three full days of recording of watchman's rounds, eliminating dial changes over week-ends. Records up to 40 stations.—**LATHEM WATCHMANS CLOCK CO.**, 72 Third St., N.W., Atlanta, Ga.

O-29 Steel Buildings

Catalog No. 200—Shows how Allied steel buildings are constructed of standard sections ideal for any building need. The buildings are custom-built from inexpensive standard sections and can be furnished insulated or with asbestos-covered roofs. — **ALLIED STEEL PRODUCTS CORP.**, 2100 N. Lewis, Tulsa, Oklahoma.

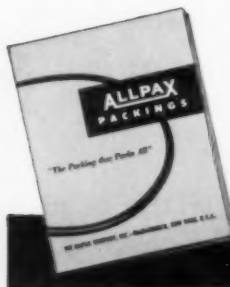
O-30 Wood and Steel Tanks

Catalog, 50 pages—Covers company's complete line of agitator, reservoir, rectangular, half-round, sphere, steel storage, cone bottom and standpipe tanks. The catalog is extensively illustrated describing wood and steel tanks for nearly every application.—**W. E. CALDWELL CO.**, Brook Street at Brandeis, Louisville 8, Kentucky.



ALLPAX RINGS THE BELL!

ALLPAX Rings the Bell with the development of precision packing rings, designed for performance, and made of the finest materials available. Whether open-end or solid molded type, ALLPAX packing rings are precision made to your exact specifications. They increase efficiency because they give better service. Sample rings sent upon request.



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See our complete line of packings, tools, and gasket materials. Distributors in principal cities.

THE ALLPAX COMPANY
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O-31 Transformers

Brochure, 8 pages—Describes complete line of distribution and power transformers in sizes from 3 kva to 15,000 kva, and up to 115 kv primary class. Eighteen features of distribution transformer design are outlined and data on coil and core assembly is presented. Detailed mechanical data tables are included.—CENTRAL TRANSFORMER CORPORATION, P. O. Box 687, Pine Bluff, Arkansas.

O-32 Cooling with Air

Brochure, 12 pages — Explains "Solo-aire" and "Combin-aire" methods of eliminating or minimizing water problems by dissipating heat direct to air. Typical problems and solutions are given. Photographs illustrate applications in a wide variety of services directly using ambient air for cooling, and the "one package" integrated cooling system using combination of maximum air and minimum water.—HUDSON ENGINEERING CORPORATION, Fairview Station, Houston, Texas.

O-33 Steel Buildings

Catalog No. 2, 26 pages — Photographs show Star steel buildings in use by specific plants in various industries including warehouses, gins and mill buildings, factories, and many others. Construction details are explained; and building components, estimating data sheet, sample floor plan, and engineering service are covered.—STAR MANUFACTURING COMPANY, 3012 South Stiles, Oklahoma City, Okla.

O-34 Pipe Covering

Bulletin, 6 pages — "Walex" corrosion resistant permanent aluminum pipe covering is described. Photographs show four steps necessary for simple application. Gives specifications and tells how insulation is protected and labor costs are cut.—WALEX METAL PRODUCTS COMPANY, 1202 West 14th St., Houston 8, Texas.

O-35 Castings

Catalog, 28 pages — Partial list of company's foundry products and equipment, together with engineering data and tables for ready reference. Describes large capacity foundry facilities, with high precision and extra large capacity machine tools for heavy industrial and marine work as well as sugar machinery. Photographs illustrate equipment, and plant applications.—SERVICE FOUNDRY, 416 Erato St., New Orleans 13, La.

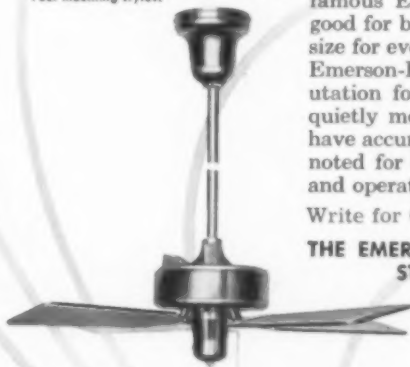
O-36 Plastic Shapes

Loose-leaf catalog, 34 pages—Engineering data, ordering specifications, and price lists for sheets, rods, tubes, tapes, packing sets, bellows, spiral back-up rings, o-rings, envelope gaskets, filled teflon, vees, and special shapes available in DuPont's Teflon, Kellogg's Kel-F, and Hi-Quality Nylon, are given, with photographs and line drawings for illustration.—JOHN L. DORE CO., P. O. Box 7772, Houston 7, Texas.

For More Free Data CIRCLE CODE NO.
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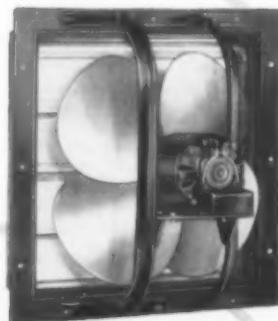
Emerson-Electric air circulator. Two sizes—capacities: 6,500 C.F.M. for 24-in. size; 8,400 C.F.M. for 30-in. size... Four mounting styles.



Emerson-Electric ceiling fan. Two sizes—24-in. and 32-in. Electrically reversible and non-reversible models—capacities up to 7,000 C.F.M.

"Active Air"

...good for business



Emerson-Electric direct-drive exhaust fans with shutters attached. Three sizes: 12-in., 16-in. and 18-in. Capacities up to 3,100 C.F.M.

Make everybody comfortable by putting "ACTIVE AIR" to work in restaurants, institutional buildings, stores and shops with these three famous Emerson-Electric fans. It's good for business. There's a type and size for every purpose—all backed by Emerson-Electric's long-standing reputation for highest quality... They quietly move large volumes of air—have accurately balanced blades—are noted for long life, low maintenance and operating costs.

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install peak performance into your compressors (AIR • GAS • AMMONIA)



Peak performance, maximum efficiency, greater output, and lower power costs can be built into your oldest, and of course your newest, compressors by the installation of VOSS VALVES.

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- ✓ 20 to 60% more valve area
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TODD SHIPYARDS CORPORATION

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Bulletin Board (Continued)

O-37 Electrical Equipment

Pictorial Index, 16 pages — Shows a number of the principal items of electrical equipment, including explosion-proof air circuit breakers and magnetic motor starters; explosion-proof lighting panels, control stations, junction boxes and special equipment; water-tight and dust-tight cast iron junction boxes; high voltage motor starters with current-limiting fuses, etc.—NELSON ELECTRIC MANUFACTURING CO., 217 N. Detroit St., Tulsa, Okla.

O-38 Pipe Connection

Catalog 55, 12 pages—General description of new "Graloc" pipe connection featuring "one specification" for all piping applications and pressure ratings; includes construction, operation, advantages, specifications, dimensions, and price list. Illustrated with photographs and line drawings. — GRAY TOOL COMPANY, P. O. Box 2291, Houston, Texas.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 17

O-39 Linings and Coatings

Data sheets describe company's rubber, neoprene and polyvinyl chloride lining and coating service for pipes, valves, tanks, ducts, vessels, etc. Provide protection against corrosion and abrasion in handling acids, bases, salts and fumes; coatings conductive or non-conductive, soft or hard, suitable for high or low temperature operations.—RADIATOR SPECIALTY CO., 1466 West Independence Blvd., Charlotte, N. C.

O-40 Gas Burner

Bulletin—Describes the Rectilinear gas burner, an application of the venturi principle which provides high input through narrow rectangular openings for firing—in a horizontal plane through fire doors or small openings over handfired coal grates or stokers—or for firing in a vertical plane on either side of stoker or oil burner.—THE WEBSTER ENGINEERING COMPANY, 419 West 2nd St., Tulsa, Okla.

O-41 Steel and Alloy Tanks

Catalog 102-P&BS—All types of tanks for hot water storage, bulk liquid storage, oil or chemical storage, and other unfired pressure vessel use are illustrated and described.—J. J. FINNIGAN CO., INC., 455 Means St., N.W., Atlanta, Ga.

O-42 Maintenance Ideas

"Genius at Work" — Contains ideas about plant maintenance, bits of philosophy, new products and a description of the company's line. — KANO LABORATORIES, 1047 S. Thompson Lane, Nashville 11, Tenn.

O-43 Oil & Gasoline Containers

Catalog No. 55—Illustrates and describes entire line of oilers, safety cans, and oil and gasoline containers available for industrial plants and other users.—EAGLE MANUFACTURING CO., Dept. 55, 2553 Charles St., Wellsburg, W. Va.

O-44 V-Drive Selections

Engineering Guide No. 50-B—Tells how to make V-drive selections quickly and accurately, using new horsepower rating and improved rating techniques. Simplified formulas for standard quarter-run and V-flat drives are augmented by tables of drives in all belt sections. — FORT WORTH STEEL & MACHINERY COMPANY, P. O. Box 1038, Fort Worth, Texas.

O-45 Safety Equipment

Catalog No. 54A, 28 pages—Illustrates and describes protective equipment. Includes chemical reference charts, glove selector guide, and information on use and care of all-neoprene, synthetic, and natural rubber safety gloves for industrial use. — CHARLESTON RUBBER COMPANY, Stark Industrial Park, Charleston, S. C.

O-46 Industrial Traps

Bulletin No. 800, 12 pages—Illustrates and describes the "Unitrapp," an all purpose, universal steam trap for pressure ratings of 0 to 250 lb. Covers design, construction, operation, and other pertinent information. Includes steam pipe selection chart.—PERFECTING SERVICE CO., 332 Atando Ave., Charlotte, N. C.

Books for the Plant Engineer

Electric Utility Engineering

By CHARLES A. POWELL

PUBLISHED BY THE TECHNOLOGY PRESS
Massachusetts Institute of Technology, and

JOHN WILEY & SONS, INC.
440 Fourth Ave., New York 16,
N. Y.

"Principles of Electric Utility Engineering" covers the essential features of the entire field in one volume. The author has selected those problems which he finds basic to the design and operation of a utility. He presents them in a framework of engineering philosophy, discussing the long-established principles behind the problems.

A general introduction explains the corporate structure of the typical utility; definitions used in business; federal and state controls to which it is subject and the financial return to be anticipated with given rates.

There is every reason— and now is the season—to **TEST YOUR TOWER**

Thanks largely to Marley's "Test Your Tower" crusade, it is generally accepted today that the purchaser of a cooling tower is entitled to proof of positive performance. Only a test is proof positive—and the best season of the year for tower testing is at hand.

So if you haven't done so already, write today for Marley's technical bulletin, "Test Your Tower". It offers a simple, proven method by which you can determine how closely your actual tower performance measures up to specified performance. Such information is well worth knowing, particularly in those industries where the whole tempo of operations is closely geared to temperature of process cooling water. Knowing your tower's capabilities and limitations will also help you make sound plans for the future if you have purchased a tower with plant expansion in mind.

Whatever your situation, it pays to test, and now is the time. Write for your copy of "Test Your Tower" today!

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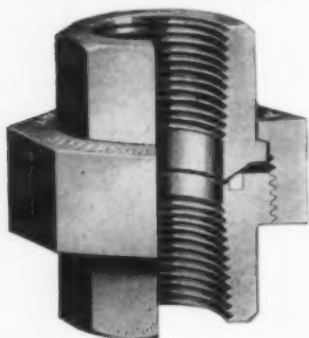
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A-4 PIPE UNIONS



**... will help make better
pipe fitting jobs for
YOU, too**

There are so many really important reasons for the supremacy of Jefferson Unions . . . reasons so easily proved . . . that it will be greatly to your advantage to standardize on Jefferson and fully satisfy your most exacting needs. For example:

... they are of uniform high quality such as to assure everlasting dependability. Jefferson employs air refined malleable iron as a material of construction having a tensile strength of 55,000 lbs. P.S.I. providing maximum basic strength.

... they have been demonstrated time and again over many years in service for their savings in both installation and maintenance costs. It has invariably paid to specify "Jefferson" . . . and use them.

... seat rings cut from specially drawn hard brass tubing make a nonporous seat which experience has shown is far better than seats of other materials. Furthermore, seats are GROUND, not just finish machined. Jefferson can furnish seats of either brass or iron-to-iron, depending on service needs.

... all Jefferson Unions are carefully air-tested for your protection in service. This can be proved from our records of service and from an irreducible quantity of unions returned as defective.

... Jefferson Unions enjoy the approval of Underwriter's Laboratories.

In addition to the high quality of the top Jefferson line, which in many instances can be used to replace higher priced steel unions, Jefferson can furnish 90° and 45° Union Elbows, Union Tees and Flange Unions. The complete line includes 150#, 250# and 300# unions and union fittings. Here is your opportunity to use a line of pipe unions which will meet ALL requirements and which will give the finest kind of performance. Investigate NOW. Ask your nearest distributor.

JEFFERSON UNION CO.

45 Fletcher Ave.,
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Make it your business to satisfy your most urgent needs on EVERY piping job.

News for the South & Southwest (Continued)

Starts on Page 11

General Electric's \$25 Million Rome, Georgia, Transformer Plant Now Separate G. E. Department

Formation of a new manufacturing department of the **General Electric Company**, the Medium Transformer Department, with headquarters at **Rome, Georgia**, has been announced by **William S. Ginn**, general manager of the company's Transformer Division.

The Rome plant of the Power Transformer Department has become a separate product department, responsible for its own engineering, manufacturing and marketing.

The \$25 million plant was opened in 1954 and now employs about 1,200 persons in the manufacture of medium-size power transformers — units rated from 501 to 5,000 kilowatt-amperes, single phase, and 501 to 10,000 kva, three-phase, 69 kilovolts and below.

David B. Lawton, is general manager of the new department. He joined G. E. in 1929 in the former Industrial Control Division at Schenectady, N. Y., and became a foreman there following his graduation from Middlebury College, Middlebury, Vt., in 1932. During the war he worked at the Fort Edward, N. Y., plant, rising from general foreman to plant manager.

Five section managers for the new Medium Transformer Department have been named by Lawton. They are: **Theodore F. Volkmer**, manager — engineering; **David Hopley**, manager — manufacturing; **Christopher T. Kastner**, manager — marketing; **Wilbur A. Bethel**, manager — finance; and **George D. Austin**, manager — employee and plant community relations.

Volkmer joined G. E. in 1936 after receiving a B. S. degree in electrical engineering at Iowa State College. He worked at Fort Wayne, Ind., Detroit, Mich., and Erie, Pa., before going to Pittsfield, Mass., in 1932 as a power transformer design engineer. He was named assistant section engineer of the small power transformer section in 1947 and has headed the engineering section of the Rome plant since 1952.

Hopley started with the company as a layout man in the tank and blacksmith shop in Pittsfield in 1926, became a foreman two years

later and assistant general foreman of the power transformer shop in 1931. He was transferred to the naval ordnance department in 1941 and served there throughout the war, rising to superintendent of both ordnance plants in Pittsfield in 1946.

Kastner was graduated from Yale University in 1946 with a M. E. degree and joined the G. E. test program that summer. After assignments in Schenectady, N. Y., and Lynn, Mass., he came to Power transformer sales in Pittsfield in 1947. He was named supervisor of traveling sales specialties in 1952 and supervisor of medium transformer sales later that year. Early in 1954 he became manager of transformer apparatus sales and in September that year manager of sales for the Rome plant.

Bethel joined the G. E. business training course in 1937 after graduation from Iowa State College. He served as a traveling auditor from 1941 to 1946, when he was named assistant to the works accountant in Pittsfield. The following year he became supervisor of accounting and statistics for the former Transformer and Allied Products Division.

Austin is a veteran of 33 years' service with G. E. He started in the porcelain plant at Pittsfield in 1922, worked at various jobs in wage rate setting and cost accounting, became assistant supervisor of production for the power transformer division in 1937 and supervisor in 1940. He has specialized in labor relations since 1946 and was named manager of labor relations for the department in 1952.

Headquarters for all five sections are at Rome.

In the marketing section, **Kastner** has named **Robert B. Ames** as manager — medium transformer sales; and **Claude W. Hiers** as manager — product planning and marketing administration.

Ames was graduated from the University of Maine with a B. S. in electrical engineering in 1949 and a M. S. in 1950. After test assignments in Lynn, Mass., and Pittsfield he joined the power transformer marketing or-

ganization in 1951 as a specialist in marketing research and product planning. He has been supervisor — proposition sales, at the medium transformer plant at Rome.

Hiers won a bachelor's degree in electrical engineering at the University of Florida in 1941. During the war he was a radar officer in the U. S. Army Signal Corps. He came to G. E. on test in 1945. After assignments in the electric utility engineering section in Schenectady, he became a specialist — marketing research and product planning for the Power Transformer Department, first at Pittsfield in 1954, and later at Rome.

Texas Co. Opens Atlanta Tech. Serv. Div. Office

Texaco has expanded its specialized service to Southern industry by opening a Regional Office of the Technical Service Division in Atlanta, Georgia. Address of the new service headquarters will be 873 Spring Street, N. W.

Mr. J. F. Collins is the new Texaco Technical Service Regional Manager in Atlanta. His assignments at Texaco's Port Arthur, Texas, Refinery and New York City and Houston offices have centered on services to industrial consumers. His most recent post was Technologist in the Company's Houston office. He is a graduate of Alabama Polytechnic Institute where he was awarded a B. S. in chemical engineering in 1927.

Combustion Engineering Nuclear Research Center

Combustion Engineering, Inc., has contracted for the purchase of a 530-acre site in Windsor, Connecticut, on which it will build a Nuclear Engineering and Development Center.

The Center will comprise facilities for the complete design and development of nuclear power reactors, for the construction of reactor cores, and for the manufacture of related atomic fuel elements. Costing upwards of 5 million dollars, the Center will begin operations late next year and by 1957 will employ several hundred people in its various departments, largely engineers, scientists and technicians. Stone & Webster Engineering Corporation have been engaged to serve as architects and engineers.

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*for PIPES...
VALVES...
TANKS...DUCTS
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Are you handling acids, bases, salts or other hard-to-handle chemicals or fumes in your production? We coat pipe-lines, tanks, valves, ducts, etc., for longer, more efficient operation. Compounds can be made conductive or non-conductive, soft or hard, suitable for high or low temperature operations.

Long-established Southern Company now offers you speedier service, lower transportation costs, important savings in your maintenance and new installations involving such specialized equipment. Our highly skilled personnel and newest production techniques can increase your plant efficiency.



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There is a specific Chromalox Electric Heater to heat liquids, air and gases. For heating platens, dies, molds, moving metal parts . . . anywhere you need fast, clean, economical and easy-to-control heat up to 1100° F.

Let the Chromalox Sales-Engineering staff solve your heating problems . . . electrically

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of Catalog 50

Contains information on complete line of Chromalox Electric Heaters, elements, thermostats, contactors and switches. Gives uses, construction information and prices, plus basic heat calculation data and heat loss charts.

For ideas on additional applications of electric heat, request Booklet F1550—"101 Ways to Apply Electric Heat." Write today.

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- ☐ Please send me Catalog 50
☐ Please send me "101 Ways"
☐ Have a Sales-Engineer contact me.

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Company _____
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A-4447A
C. B. Rogers and Associates, 1000 Peachtree St., N. E., Atlanta 5, Ga.; L. R. Ward Co., 3009-11 Canton St., Dallas 26, Texas; 1814 Texas Ave., Houston 3, Texas; Ranson, Wallace & Co., 116½ E. Fourth St., Charlotte 2, N. C.

Trawick Named Zurn Sales Representative in Birmingham

J. G. Trawick has been appointed sales representative in the Birmingham, Ala., area for Zurn Southern Services, Inc., southern states marketing organization for the engineered industrial and marine products of J. A. Zurn Mfg. Co., Erie, Pa.

With an office at 1028 Seventh Avenue S., Birmingham, Mr. Trawick will call upon industrial and marine engineers throughout Alabama and parts of Florida.

Pacific Pumps Appoints Southeastern Representative

Pacific Pumps, Inc., Huntington Park, California, has announced the appointment of a new sales representative, Evans L. Shuff & Associates, for the Southeastern United States.

Shuff & Associates' territory covers western Florida, eastern Tennessee, and the entire states of Georgia, North Carolina, South Carolina and Alabama.

Arthur S. LaPine Louisiana and Gulf Coast

L. D. Long will represent the laboratory supply firm of Arthur S. LaPine & Company in Louisiana and the Gulf Coast.

Mr. Long's previous experience has been as a chemist in Chattanooga, Tennessee, and Columbus, Ohio, laboratories and with Southern Regional Laboratories in New Orleans.

Graton & Knight Repr.

William S. Johnstone has been named Sales Representative for the South Carolina and east Georgia area by the Graton & Knight Company (Worcester, Massachusetts) world's largest manufacturer of industrial leather products.

He was formerly sales representative for the Ragan Ring Company, covering South Carolina for the past three years. He will operate out of Greenville, selling the Graton & Knight line of leather belting, textile leathers, packings and other industrial leather products.

ERNST STAINLESS STEEL GAGE



SHIPMENTS
FROM STOCK

FIG. 855

(with 1/2" or 3/4" connections)

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BURNER COMPANY, INC.**

1279 E. Sedgley Ave., Philadelphia 34, Pa.
Southwestern Division
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Baltimore Gas & Electric Plans 5-Year Expansion

The Baltimore Gas and Electric Company announces that expenditures for new construction during the next five years are estimated to total more than \$211,000,000.

The great bulk of these expenditures, \$166,800,000 or an average of \$33,360,000 per year, will be spent for the expansion of the Company's electric system. \$36,975,000, or about \$7,395,000 per year, will be spent for the expansion of the gas system and the balance of approximately \$8,000,000, or \$1,600,000 per year, for miscellaneous facilities including office and shop quarters, vehicles, furniture and fixtures, steam heating facilities, etc. For 1956 the estimated expenditure for new construction will be about \$40,000,000.

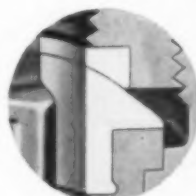
Among the major projects on which substantial expenditures will be made in 1956 are:

The second electric generating unit at the Herbert A. Wagner Station, now scheduled for completion by the early part of 1956; three new large master substations, one each in the eastern, western and southern sections of the Company's system, together with tie cables and transformers for these substations; and 25 new electric substations of smaller size, 16 to be placed in service in 1956 and 9 in 1957. The 1956 program also includes funds for 5 major gas main installations required to make additional gas available to various sections of the Company's territory by next winter, the largest being an extension of 12½ miles of 10" main to augment the gas supply to the Annapolis area.

United States Gasket & Belmont Packing Merge

The United States Gasket Company, Camden 1, New Jersey, and The Belmont Packing and Rubber Company, Philadelphia 38, Pa., have announced a consolidation of their product lines, sales organizations and activities under the merchandising name of U. S. Gasket-Belmont Packing. Harry Stott, who headed sales for United States Gasket Company, is General Sales Manager of the new combination.

This new major source will offer one of the most complete lines of mechanical packings, gaskets, piping specialties, rotating mechanical seals, and the largest stocks of Teflon and Kel-F available to industry today.



**"Note the
True Ball Joint
...that's a DART
Exclusive"**



Yes, Dart Unions fit tighter and last longer because their two bronze seats are precision ground to a true ball joint. You get a drop-tight connection without straining arm, wrench or union. What's more, a Dart uncouples just as easily. Ask your supplier.

QUICK FACTS

- Extra wide bronze seats resist pitting and corrosion.
- Nut and body of air-refined, high test malleable iron are practically unbreakable
- Heavy shoulders can withstand the toughest wrench abuse
- Each Dart is individually vacuum-tested

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THE Fairbanks COMPANY

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• REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astonishing advantage—when repair work is completed belts may be returned to service immediately.

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4625 Lexington St., Chicago 44, Ill.

REMA

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VULCANIZING

RUBBER REPAIR MATERIALS

News for the South & Southwest (Continued)

Midwest Piping Names Becker General Manager of Sales

Phil R. Becker has been named general manager of sales by Midwest Piping Company, Inc., St. Louis. A graduate of Washington University, Becker has served with Midwest since 1939. In 1949 he became sales manager of the company's Welding Fitting Division. In his new position he will have overall responsibility for the national sales program of all divisions of the company.



Midwest is a major fabricator and erector of industrial and power piping systems. In addition to two major plants and headquarters in St. Louis, the company operates plants in Clifton, N. J., and Los Angeles.

Plastic Pipe Applications Featured in New Color Film

The increasing use of plastic pipe in industry for underground installations is depicted in a documentary sound and color motion picture produced by Eastman Chemical Products, Inc., of Kingsport, Tenn. The 30-minute, 16 mm. film shows several typical installations of its Tenite butyrate plastic pipe, the manner in which it is laid, its simplicity, ease, and flexibility of use, and evidence of its resistance to corrosion and clogging.

Industrial uses for plastic pipe include power generating plants, agricultural irrigation projects, natural gas lines, public utilities, civil engineering, construction industry, and architects serving those fields.

Interested groups may request the film without any charge by request-

ing "Plastic Pipelines" from Eastman Chemical Products, Inc., Kingsport, Tennessee.

Westinghouse — Baltimore Div.

Walter E. Benoit has been named executive assistant to the manager of the Baltimore Divisions of Westinghouse Electric Corporation. W. I. Bendz succeeds Mr. Benoit as manager of the electronics division.

Mr. Benoit joined the company in 1915 as a time clerk in the Chicopee, Mass., plant which was moved to Baltimore in 1938. Following service in World War I, he rejoined the company's newly formed radio division where he advanced to the position of accounting manager by 1938.

Six years later, Mr. Benoit was elected vice president and director of the firm's subsidiary, the Westinghouse Broadcasting Company. In 1948, he served one year as treasurer of Industria Electrica de Mexico, a Westinghouse licensee. In 1951, he was appointed manager of the air arm division and became electronics division manager one year later.

Mr. Bendz began his career with Westinghouse in the graduate student training course following his graduation from Massachusetts Institute of Technology in 1928. Until 1932, he was assigned to control engineering in Pittsburgh, Pa.

Between 1932 and 1948, Mr. Bendz served in Boston, Mass., sales office as engineering and service manager. Immediately prior to accepting his new appointment as electronics division manager, Mr. Bendz had been for the past seven years chief engineer for the Sperry Products, Inc., of Danbury, Conn.

International Nickel — Texas

Branch M. McNeely, Jr., has joined the Development and Research Division of The International Nickel Company, Inc., as a member of the Texas Technical Field Section with headquarters at Houston, according to an announcement by Donald J. Reese, Assistant Manager of the division.

Lion Oil Co. — Atlanta

Lion Oil Company, a Division of Monsanto Chemical Company, has moved the Montgomery, Alabama, chemical sales offices to Atlanta, Georgia.

Lion's newly-established southeastern district sales offices in Atlanta are located in the 1401 Building and are under the direction of R. S. Johnson. Other divisions of Monsanto Chemical Company also maintain sales offices in the 1401 Building.

Carolina Utilities to Share Atomic Information

A four-man committee to exchange ideas on nuclear energy will represent Carolina Power & Light Company, Duke Power Company, Virginia Electric Power Company and South Carolina Electric and Gas Company.

The committee grew out of a recent conference of executives of the four companies. In addition to acting as an "information exchange center," the group later may serve in an advisory capacity.

Its members are: Raymond Talton, production engineer, CP&L; H. W. Oettinger, executive assistant, Duke; R. M. Hutcheson, system manager-production, VEPCO; and George Dibble, manager of production and transmission, SCE&G.

The Atomic Energy Commission last year granted CP&L "security clearance" to receive classified information on nuclear energy. Twelve persons within the company were granted individual security clearances.

Welding Society Section Formed in Shreveport

A new section of the American Welding Society has been formed in Shreveport, Louisiana, to bring the total of active sections throughout the nation to 78. Members in the new section are drawn from twenty-four different industries in the Shreveport area.

Officers of the section are J. L. York, Chairman; Joy Kelley, 1st Vice Chairman; E. B. Reeves, 2nd Vice Chairman; Alton Henderson, Secretary and Hollis Greene, Treasurer.

THIS

BEARING SERVICE HELPS YOU IN MANY WAYS

The development of a complete standardized line of stock Sintered Bronze Bearings and Bars by Bunting opens the door to many economies and advantages in production and maintenance of machinery and mechanical components.

Here is a far more complete range of standard sizes than has heretofore been available in this material. Bunting's powdered bronze stock line is the first to include all ASTM standard sizes to ASTM recommended dimensions and tolerances in both plain and flanged bearings and thrust bearings.

Together with the long established Bunting stock line of Cast Bronze Bearings and Bars, these new sintered bronze Bunting products bring to mechanical industry ready-to-use bearings that will squarely meet your blue print and cost requirements.

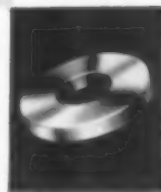
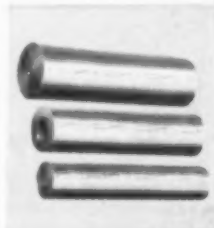
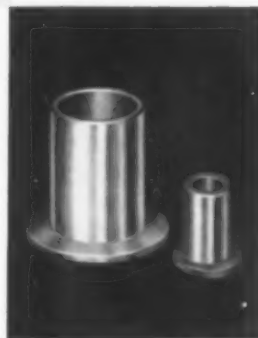
Both Bunting Cast Bronze and Bunting oil filled, self-lubricating sintered powdered Bronze Bearings and Bars are available to you through your nearest Bunting Distributor. He has in stock all sizes for your immediate needs. Ask him or write for complete lists and dimensional data on Bunting Cast Bronze and Bunting Sintered Bronze Bearings.




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**NEW
LIQUIDOMETER
INDICATOR**

**SAVES SPACE
ON INDUSTRIAL
CONTROL PANELS**

Twenty-inch dial in 3x10 1/4" case permits close readings

The new Liquidometer Model 216 Indicator gives the plant engineer a reliable, automatic reading of storage tank contents. Available in either vertical or horizontal design, the compact and highly readable Model 216 Indicator makes possible multiple installations on crowded control panels.

Teamed with Liquidometer's time-tested hydraulic transmission gaging system, the new indicator provides instantaneous remote indication of liquid levels—automatically. No outside power source is required. Virtually any liquid may be measured, and the indicator can be located up to 250 feet from the tank.

Engineered for dependability, the Liquidometer gaging systems highlight these design features:

- Maintenance free
- Integral temperature compensation
- Ease of installation—requires only one 2" diameter tank opening
- Safety—all gages Underwriters approved for hazardous liquids

For further details on the new Model 216 Indicator, write Dept. F for Bulletin 532.



THE LIQUIDOMETER CORP.

SKILLMAN AVENUE AT 36th STREET
LONG ISLAND CITY 1, NEW YORK

Louisiana Adipic Acid Plant

Construction is underway at Luling, La. on a new plant for the large-scale production of adipic acid, representing a major expansion in the product by **Monsanto Chemical Company's Organic Chemicals Division**.

Located at **The Barton Plant of Lion Oil Company**, a Division of Monsanto, the new unit is estimated to cost several million dollars and is expected to be on stream early in 1957.

Long used in the manufacture of nylon, adipic acid has come into recent and rapidly expanding use in the manufacture of flexible polyurethane foams for crash pads, seating, carpet underlay and a variety of other cushioning applications. The reactive dibasic acid also is used to modify surface coating resins, to impart flexibility to vinyls and to improve the flexibility of polyesters. These resins find wide use in casting, molding, laminating, impregnating, bonding and sealing applications. Other uses of adipic acids include the manufacture of synthetic lubricants, detergents and textile chemicals.

Rufus C. Barkley, Jr. Named V.P. of Cameron & Barkley

Rufus C. Barkley, Jr., has been named Vice President of **The Cameron & Barkley Company**, Charleston, S. C., distributors of industrial supplies and machine tools with branches in Savannah, Georgia, and Jacksonville, Orlando, Tampa and Miami, Florida.

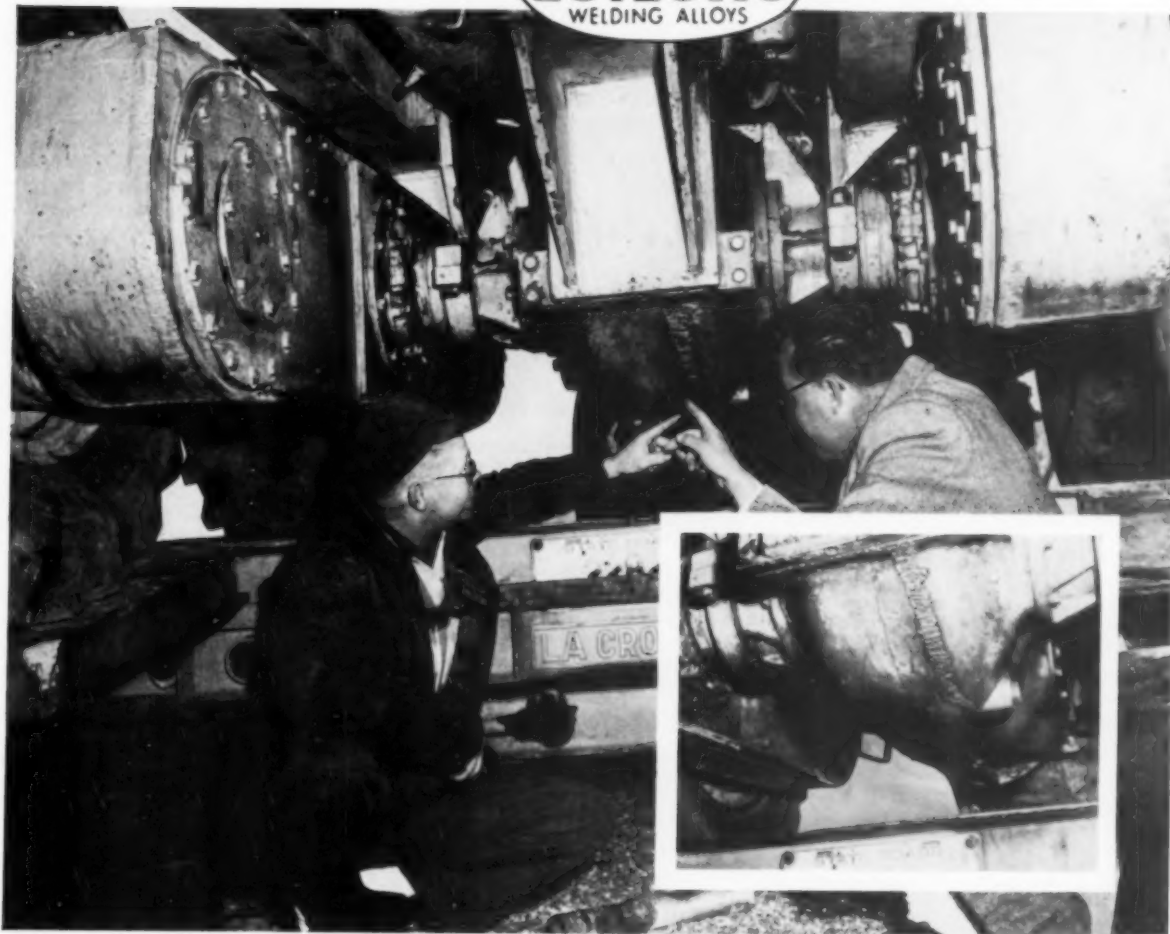
Mr. Barkley represents the fourth generation of his family to be actively engaged in the affairs of the company which was started in 1865. Born in Charleston, he is a graduate of the Episcopal High School, Alexandria, Virginia, and the University of Virginia. After two years of military service he returned home to take active part in the administrative and selling operations of the company.

His responsibility as Vice President will continue in the areas of sales, advertising and administration, with particular emphasis being placed on liaison with the national firms whose products are being handled by Cameron & Barkley. These include Blaw-Knox gratings, Babcock & Wilcox, Link-Belt, Lunkenhimer, Raybestos - Manhattan, Cooper Alloy, LaSalle and Roebling.

AN EXAMPLE OF



AT WORK!



\$82.50 "IMPOSSIBLE" WELD SAVES \$1,000

When a forty-inch break developed in the rear housing of this Rome Motor Grader — owned and operated by a Southern State Roads Commission—it could not be operated. To replace the housing would not only take four months, but involve a cost of over \$600 for the housing alone. The labor of dismantling and replacement, and the downtime would bring the actual cost to well over \$1,000.

The only alternative was to weld, an operation that some thought impossible. But, in only 8 hours of actual welding time and at a cost of \$82.50 including welding, welding alloys, mechanic's time, etc., the housing was repaired so perfectly that, after severe usage, the grader is still in operation. Thus, Eutectic's new Xyron 2-25, the welding alloy specified, helped the Southern State Roads Commission save the taxpayers of that state \$1,000. Here's how it was done:

Without dismantling, the entire break was vee'd to 1/16 of an inch of the bottom of the break with a flexible, portable grinder and a hole drilled at each end of the break. To avoid any possibility of distortion, the break was tacked at the heavy points of the casting. The Shop Foreman at the State Roads garage welded the break by following the vee with two or three inch passes until the entire area was welded. Each pass was peened and a final pass made over the weld area onto the casting to provide added strength.

The revolutionary non-cracking property of Xyron 2-25 eliminated the possibility of "leakers" and oil seepage. The EutecTrode's remarkable fluidity, wash and unique Xyron 2-25 ease of application made possible time and money-saving position welding.

That's just the way Eutectic Low Temperature Welding Alloys prove themselves, on

job after job. Xyron 2-25 is just one of the many new developments in welding alloys created by Eutectic's continuing research program.

Today, with over 160 different, job-engineered "Low Temperature Welding Alloys" to choose from, your Eutectic District Engineer is ready to show you, right in your own shop, how one or more of these "Low Amp" EutecTrodes or "Low Temp" EutecRods will cut your production and maintenance costs. Why not call him today for your free demonstration?

More facts on saving money with Eutectic "Low Temperature Welding Alloys" are contained in the helpful new 32-page booklet "DirectoRod Guide." Ask for TIS 1340 today.

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SOUTHERN POWER & INDUSTRY for MARCH, 1956



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Call or write McBurney Stoker and Equipment Company on all firing problems. Convert to the best boiler room equipment available. Whether your firing system requires wood, coal, gas, oil or any other fuel or combination of fuels, McBurney Stoker and Equipment Company has designed units to fit your particular needs. McBurney has served industry since 1911, and offers such fine firing equipment as: Copes-Vulcon Boiler Controls, Copes Feedwater Regulators, Vulcan Soot Blowers, McBurney Underfeed Coal Stokers, Forced Draft and Atmospheric Gas Burners, Steam and Mechanical Atomization Oil Burning Equipment, Gas and Oil Burning Equipment.

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News for the South & Southwest (Continued)

Continental Gin Company Personnel Changes



EUGENE H. BROOKS now Executive Vice President of Continental Gin.

Eugene H. Brooks, formerly vice president in charge of sales, of Continental Gin Company has been elected executive vice president of the company and Glenn P. McCarty, of Dallas, Texas, formerly sales manager of the Western District, has been named vice president, Western District, according to Merrill E. Pratt, president.

Promotion of the two officers was made at a recent meeting of the company's executive committee in Atlanta, Mr. Pratt stated. He also announced that concurrently with their election the following appointments had been made by the management.



RALPH Y. MacINTYRE is now Manager of Continental Gin's Sales Development.

Ralph Y. MacIntyre, formerly manager of the Industrial Division, will become manager of Sales Development.

George C. Morgan, formerly manager of Special Products Division, will direct the Industrial Division.

The company's Special Products Division, which handled primarily

the development of new products and contract manufacturing, is being merged with the Industrial Division. The Industrial Division has been engaged in designing and selling conveying, elevating and materials handling equipment.

R. T. Dorsey, formerly assistant district sales manager of the Memphis Office, has been appointed general sales manager, Gin Machinery, and will reside in Birmingham.

T. L. King, formerly sales engineer, has been appointed manager, Sales Engineering.

G. C. Cagle, Jr., formerly assistant sales manager, Western District, has been appointed sales manager, Western District.



GEORGE C. MORGAN will direct the Industrial Division activities.

In a statement announcing these changes, Merrill E. Pratt, president, stated:

"The election of Mr. Brooks as executive vice president, and Mr. McCarty as vice president, Western District, as new officers of the company, is in keeping with the enlarged activities in both the gin machinery and the industrial field.

"Mr. Brooks came with the company in 1922 after leaving the University of California and held positions under the Memphis, Tenn. District Office, entering gin machinery sales work in 1924. In 1935 he was transferred to the Dallas Division and in 1938 was elected vice president in charge of the Western District. In 1948 he was elected vice president in charge of sales for the company, which position he has held since that time.

"Mr. McCarty came with the company in 1941 as sales engineer under the Birmingham District Office and was transferred to the Dallas District in 1947 as assistant manager. In 1952 he was appointed sales manager, Western District.

"Mr. Dorsey began his career with Continental Gin Company in 1937 after leaving the University of Tennessee and was appointed assistant sales manager of the Memphis District Office in 1950, which position he has held until this time.

"Mr. Cagle came with the company in 1940 as a sales engineer under the Atlanta District Office and was transferred to the Dallas District Office in 1952 and was appointed assistant sales manager of the Western District in 1955.

"Mr. King came with the company in 1924 after graduating from Auburn in mechanical engineering and served in various capacities under the Memphis District Office and in 1946 was appointed sales engineer and transferred to the Birmingham Head Office.

"Mr. MacIntyre's success in developing the Industrial Division and his broad contacts throughout the nation qualifies him for his larger serv-

ice as manager of Sales Development. Mr. MacIntyre, a native of California and a graduate of the University of California in mechanical engineering, began his business career with Link Belt Company in Chicago. He came with Continental Gin Company in 1936 when its Industrial Division was organized. This division has expanded into one of the company's major activities.

"Mr. Morgan's experience as manager of our Special Products Division equips him to direct the merged division which will be operated as our Industrial Division. Mr. Morgan, a native of Ozark, Alabama, and a

graduate of Auburn, joined the company in 1936 and in 1941 he organized the company's War Contracts Division. During the war he was engaged in negotiating and processing contracts with the Armed Services for war materials. In 1945 the War Contracts Division became the Special Products Division which Mr. Morgan has headed since that time."

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See Pages 17 & 18

Nothing show-off about continuous blow-off

No big blast . . . no noise . . . no clouds of steam. No wasted heat units down the drain either. Just steady removal of foreign solids to keep the boiler always in balance. It's not a flashy performer, except in the cost department. Hardly anything else in the boiler room can pay its own way so quickly. Find out why; write for catalog on "Continuous Blow-off" to The Madden Corp., 1543 W. Morse Ave., Chicago 26, Ill.

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● Whatever your needs in pressure vessels—gas storage tanks, pressure spheres, creosoting cylinders, bubble towers, gas scrubbers, etc.—you can depend on COLE for tanks that are correct in design and permanently leak-proof at the welded or riveted joints.



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Classified rates are net, payable in advance, each month. Rates are based on column inch, with three columns per page, 10 inches per column, column width 2 3/4 inches — a total of 30 column inches per page.

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\$16 per column inch displayed
Rates quoted on special types of repeated advertisements.

Special "Position Wanted" Advertisements submitted by individuals seeking employment, 10 cents per word per insertion, payment with order, minimum charge \$3.00. When used, Box Number address, c/o SOUTHERN POWER & INDUSTRY, 806 Peachtree Street, N.E., Atlanta 5, Georgia, count as eight words.

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Heavy chemicals plant. Upper Ohio Valley, is seeking top notch Mechanical or Electrical Engineers with 2-4 years' power operating experience. Would join organization operating 55,000 kw multi-unit coal-fired station. Opportunities for good men in a fast growing plant. Write Box 243, c/o SOUTHERN POWER & INDUSTRY, 806 Peachtree St., N.E., Atlanta 8, Georgia.

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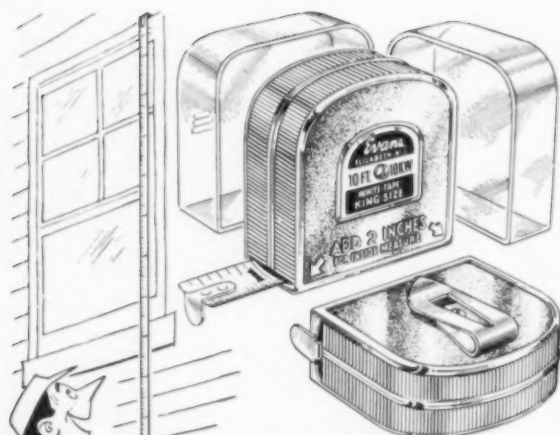
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Chicago Bridge & Iron Co.			Ladish Co.	*	The Automobile Div. of Pratt-Daniel Corp.	
Childers Mfg. Co.			Leslie Co.	77	Thomas Flexible Coupling Co.	
Cities Service Co.			Lewis & Co., Inc., Chas. S.	95	Todd Shipyards Corp., Combustion	
Claraage Fan Co.			Lim Torque Corp.	59	Equipment Division	
Classified Ads			Liquidometer Corp.	92	U	
Cleveland Tramrail Div., Cleveland Crane			Lubriplate Division, Fiske Bros.	*	United States Steel Co.	
& Engineering Co.			Refining Co.	*	U. S. Treasury	
Cochrane Corporation			Lummus Co.	*	V	
Cole Mfg. Co., R. D.			M		Virginia Gear & Machine Co.	
Combustion Control Division Electronics			Madden Corp.	95	Vort Machine Co., Henry	
Corp. of America			McBurney Stoker & Equipment Company	94	Voss Company, J. H. II.	
Combustion Engrs., Inc.			Magnetrol, Inc.	*	W	
Combustion Equipment Division Todd			Manning, Maxwell & Moore, Inc.	5	Walworth Co.	
Shipyards Corp.			Manzel Division of Houdaille Industries,	*	Want Ads	
Continental Foundry & Machine Co.,			Inc.	*	Western Steam Pump Co., Inc.	
Blaw-Knox Co.			Marley Co., Inc.	85	Webster Engineering Co.	
Continental Gin Co.			Mason-Neilan Regulator Co.	51	Western Precipitation Corp.	
Cooper-Bessemer Corp.			N		Westinghouse Electric Corp.	
Copes-Vulcan Division,			National Airoil Burner Co.	88	Westinghouse Electric Corp.,	
Blaw-Knox Co.			National Aluminate Corp.	1	B. F. Sturtevant Div.	
Crane Company			National Business Publications	*	Wheeler Mfg. Co., C. H.	
Cyclotherm Corp.			National Coal Association	78	Warrend Co., Edwin L.	
D			National Supply Co., Spang-Chalfant Div.	9	Wilson, Inc., Thomas C.	
Dampney Co.			National Tube Co.	15	Wing Mfg. Co., L. J.	
Dean Hill Pump Co.			National Valve & Mfg. Co.	*	Y	
Detroit Stoker Co.			Naugatuck Chemicals Div. U. S. Rubber Co.	*	Yarnall-Waring Co.	
Diamond Chain Co., Inc.			O		
Dollinger Corp.			P		
Dowell, Inc.			Q		
Drew & Co., Inc., E. F.			R		
Durabla Mfg. Co.			S		
Duralmetallic Corp.			T		
Durkee-Atwood Co.			U		
E			V		
Electric Service Co.			W		
Elgin Softener Corp.			X		
Ellison Draft Gage Co., Inc.			Y		



Evans King-Size 10-ft. Steel Tape STANDS UP STRAIGHT for UPRIGHT MEASUREMENTS

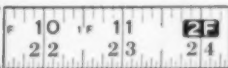
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*it's marked so you don't have to figure!
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"Standard blade
1/2" wide"



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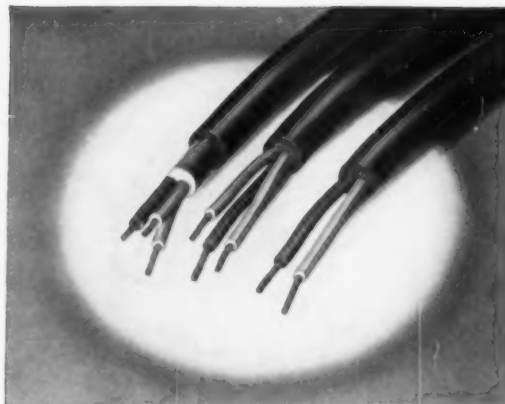
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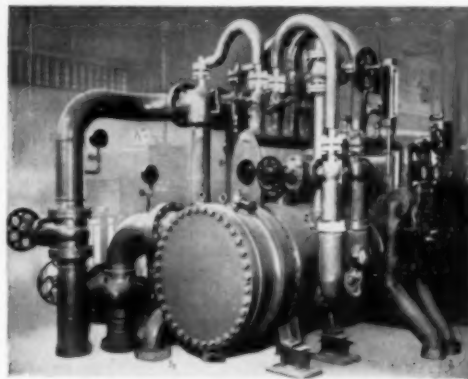


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